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NEXT WEEK . . .

Prescribed Lubrication for Iron and Steelmaking Equipment

Checking "Split Thousandths" by Optical Projection Gaging

Continuous Gas Carburizing—II

Production of Pig Iron—I

STEEL

The Magazine of Metalworking and Metalproducing

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NEWS

TECHNICAL

MARKETS

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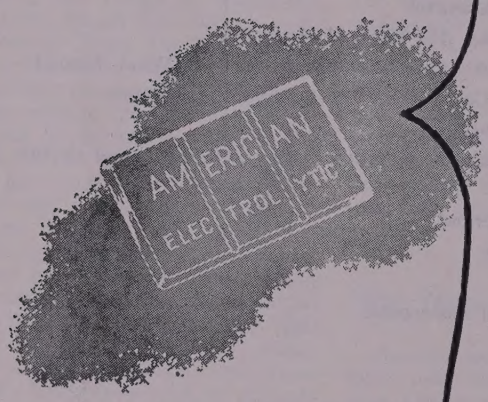

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Cure for Mergeritis

Several congressional committees and government agencies are working themselves into a lather over the increasing frequency with which smaller businesses are being merged into larger organizations. Most of the public servants who wish to do something about mergers and about "bigness" in business approach the problem with the belief that the initiative in business consolidations almost invariably is taken by the buyer. To hear the zealots' version of these situations, one would think that the big fellow, through monopoly, unfair trade practices, or other economic pressure, "forces" the little fellow to sell.

Undoubtedly there are some cases where the initiative for mergers lies with the buyer, but there probably are a greater number of instances where the first move is made by the seller. A striking example of the latter is furnished by the merger of Allied Oil Co. with Ashland Oil & Refining Co. on Aug. 3, 1948. The reason for this merger was explained in the Aug. 17, 1949, issue of "National Petroleum News" by W. W. Vandeveer, partner with Floyd R. Newman for 23 years in Allied Oil.

These partners started the Allied company in 1925 on $30,000, most of it borrowed from friends. By 1948 it had become a highly respected, profitable enterprise. Writes partner Vandeveer in connection with the merger: "We were not the victims of unfair trade practices. We were not gobbled up by any private monopoly. We were not threatened by any of our competitors—big or little. We were not a couple of doddering old men looking for a safe, quiet place to piece out the rest of our days.

"We were ready, willing and able to carry on for many more years of successful business life. We knew we could continue to increase our service to our community—and do it profitably—but Uncle Sam's tax laws backed us into a corner where we had only one of two choices: Sell out or face the risks of personal bankruptcy at the time of our respective deaths."

The Allied-Ashland merger is one of many thousands forced by oppressive tax laws. To outlaw mergers would not solve the problem. The sensible remedy is to revise taxes so that small businesses have an incentive to remain independent.

* * *

FORTUNATE WITHDRAWAL: Offer of the President's fact finding board to mediate the steel wage dispute worked out fortunately. The three men, probably sensitive to the unusual circumstances under which they function, momentarily saw a chance to render a greater service than was entrusted to them. They offered to mediate the dispute.

Before the union had given its answer to this offer, the steel companies had decided that mediation should be on a company basis instead of an industrywide basis. When this conclusion was reported to the board, it withdrew its offer to mediate. In explaining the withdrawal, the board said that to mediate on a company basis would involve the umpiring of "some 30 different situations" and that this "would be physically impossible."

This conclusion is definitely favorable to the steel company's case. It recognizes the fact that the labor relations problems of the various companies are not uniform. As one member of the board commented, "we will certainly have to take into consideration these small companies."

Withdrawal of the board's offer to mediate

(OVER)

puts the final decisions back where they belong. The board will report, after which each company will negotiate with its union. The extent to which the individual settlements vary will furnish a criterion as to how much the board's intervention and report have affected the practice of true collective bargaining. —p. 49

* * *

NEW NODULIZING ALLOY: Interest in nodular cast iron, which has mounted sharply in recent months, currently is heightened by two recent announcements. Last week the Naval Research Laboratory of the Navy Department, Washington, announced the results of laboratory tests on a new iron-silicon-magnesium alloy which may be produced at lower cost and at the same time eliminates some of the processing hazards inherent in the explosive reactivity of magnesium with molten cast iron.

Confirming and supplementing the Navy statement, Electro Metallurgical Co. now announces the commercial availability of an iron-silicon-magnesium alloy at an experimental cost of 15 cents per pound. Gray Iron Founders' Society comments that while considerable development work remains to be done on cupola gray iron of higher sulphur content, the new alloy should be of vital interest to all foundrymen because of its dual potential for nodulizing the graphite and inoculating the iron.

—pp. 53, 82

* * *

PIPE FROM GUN BARRELS: In 1792 William Murdock introduced in London a new system of lighting with coal gas. In seeking a method of conducting the gas from generator to points of use, he discovered an over-supply of old gun barrels. He threaded the ends of the barrels and thus was able to assemble a continuous pipe line. This stimulated an immediate demand for tubes and in 1924 James Russel developed a process of bending plate into cylindrical form, butting together the white hot edges and forging the joint with a tilt hammer. In the following year Cornelius Whitehouse improved on this procedure by drawing a heated flat plate through a bell.

The manufacture of butt weld pipe has been essentially the same ever since the Whitehouse invention. This and many other interesting bits of history are recounted in an article on production of butt and lap welded pipe, which is the twelfth in this publication's series on fundamentals of steelmaking. The author is H. E. Engelbaugh, Youngstown Sheet & Tube Co.

—p. 92

* * *

WARNING ON PENSIONS: A good object lesson on the importance of obtaining reliable figures on the cost of pensions before a pension plan is adopted is provided by the present plight of the coal miners' welfare fund. Benefit payments in the first eight months of 1949 totaled $84 million, compared with receipts of $57 million.

When John Lewis ordered a three-day week, he automatically reduced revenue from the 20 cents a ton royalty, but the payments for pensions, disability grants, death and other benefits continued to mount. Originally Mr. Lewis asked for 10 cents a ton to pay for these benefits. Later he raised the royalty to 20 cents. Independent actuaries say the cost of the Lewis welfare package is around 50 cents a ton.

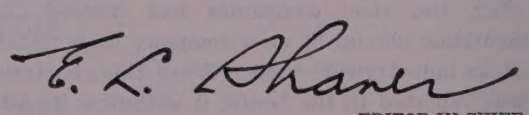
Obviously the welfare program is endangered, simply because its sponsors failed to launch it on a sound actuarial basis. —p. 50

* * *

MOTORDOM RIDES HIGH: August was a great month for the automobile industry. The August total of 675,000 completed vehicles is the equivalent of an annual rate of 7,500,000, allowing for holidays and time for model changeovers. Nobody expects motordom to turn out anything like this projected mathematical total, but optimists say that something over 6,500,000 is possible.

If a new record is registered in 1949 it will be by virtue of increased passenger car production. During the first seven months this year motor truck sales were 768,425, off 114,000 units or 13 per cent from comparable 1948 figures. Motor bus output dropped from 8693 in seven months of 1948 to 3991 in the same period of 1949, a sharp decline of 54 per cent. Sooner or later the demand for passenger cars must follow the trend that already has been traced by trucks and busses.

Some observers think Labor Day may be the turning point, but at this writing the industry continues in a strong position. —p. 63



EDITOR-IN-CHIEF

News Summary

STRIFE OR PEACE?— Whether or not the country's steel industry will be closed by a strike as result of the wage and social security dispute remains an open question (p. 49). The union is not likely to gain any substantial portion of its demands this year. Most companies will not grant pensions. A modest wage increase and some insurance concessions are possible . . . . Income and outgo figures on the United Mine Workers welfare fund indicate that ambitious welfare plan is heading for difficulties (p. 49). Benefit payments have been exceeding royalties on coal mined and the shorter work-week ordered by John L. Lewis is widening the gap between receipts and payments.

BUSINESS WEATHER— Labor Day appraisals, traditionally made at the beginning of autumn, are optimistic about business prospects, barring strikes (p. 52). The economic revival is showing surprisingly sustained strength; the steadily increasing demand for steel can no longer be ascribed merely to insurance against a strike. The rate of new unemployment is declining sharply . . . In scattered industries the future looks good. Automakers (p. 63) are watching used car markets which have held up astonishingly well all summer. Foundry equipment manufacturers (p. 55) predict an upturn this fall. Gear sales, however, are continuing their downward skid (p. 55).

HOUSING— High housing volume—more than 900,000 new dwellings may be built this year—is aiding the metalworking industry because over 4.5 tons of steel and iron products go into the average new home (p. 51). Oil and gas furnace makers expect to exceed last year's record shipments. Plumbing and household appliance sales will approach 1948 levels.

MAY LIMIT IMPORTS— Canada, good customer for United States steel and metalworking products, may curtail imports from this country to conserve dollars (p. 53). Such action, if taken, likely will be on a licensing basis and imports of items not obtainable in the Dominion will be permitted.

METAL RESERVES— America's usable metal reserves are higher because extraction of lower grade ores is now commercially practical (p. 59). The United Nations' conference on conservation also was told that the U. S. liquid and gas fuel reserves may not last beyond the turn of the century if economy measures aren't adopted on a wider scale.

SCRAP EXPORTS— The steel and foundry interests have won another round in the feud between scrap consumers and sellers over exports (p. 53). Export quotas for the fourth quarter have been held at 40,000 tons. Scrap interests had sought to have the limitations lifted or removed.

FREIGHT FREEZE— Rising freight rates are circumscribing the markets for metalworking jobbers and are hitting certain geographic regions harder than others (p. 61). For example, Japan Co., a Cleveland metal finisher, is finding its marketing area pared to county dimensions. West Coast manufacturers fear a further pinch in competition with eastern producers in eastern markets.

HERE AND THERE IN INDUSTRY— Sweeping relaxation of tin control is announced (p. 56) . . . Great Lakes Steel has been pouring heats for the past two weeks at its new "king-size" open-hearth furnace at Ecorse, Mich. (p. 54) . . . Aetna-Standard Engineering Co. is building a continuous butt weld pipe mill and supplementary units for Youngstown Sheet & Tube Co.'s Indiana Harbor plant at East Chicago, Ind. (p. 54) . . . . Steel melting units at Crucible Steel Co. of America's Park Works, Pittsburgh, sold earlier to Deere & Co., Moline, Ill., have been resold to M. N. Landay Co., Pittsburgh (p. 66) . . Allis-Chalmers Mfg. Co.'s axial compressor is the key element in the huge new wind tunnel at Langley Laboratory in Virginia (p. 60) . . . Electro Metallurgical Division of Union Carbide & Carbon Corp. is offering a magnesium-ferrosilicon alloy which promotes formation of nodular graphite in cast iron (p. 53) . . . "Phantom" orders for production of over $20 million worth of gages in the event of war are being distributed to 12 gage makers (p. 55).

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Pension Puzzle

Miners' welfare fund outgo exceeds income. Will benefits be cut or royalties increased?

JOHN L. LEWIS and his miners' welfare fund are running into serious difficulties.

Benefit payments are exceeding receipts from royalties on coal mined (see chart). In the first eight months this year outgo for pensions, disability grants, death and other benefits approximated $84 million. Receipts were about $57 million.

On July 1, the welfare fund had a balance of $29 million, the residue of an accumulation in 1946 and 1947 when royalties were first collected but before benefit payments started. If the current excess of benefit payments over income continues, the surplus soon will be exhausted.

Short Week Cuts Royalties—Coal mine operators pay 20 cents per ton of coal mined into the welfare fund. When Mr. Lewis ordered a three-day week in the mines to limit coal production and "stabilize" the industry, he cut the fund's income sharply. This week, he ordered a two-day week, which will further reduce royalties.

But the welfare fund was running into the red even before the work-week was reduced.

When first established, the fund was financed by a 10-cent a ton levy on coal mined. This later was increased to 20 cents a ton. Some actuaries believe between 45 and 50 cents a ton would be necessary to finance the fund.

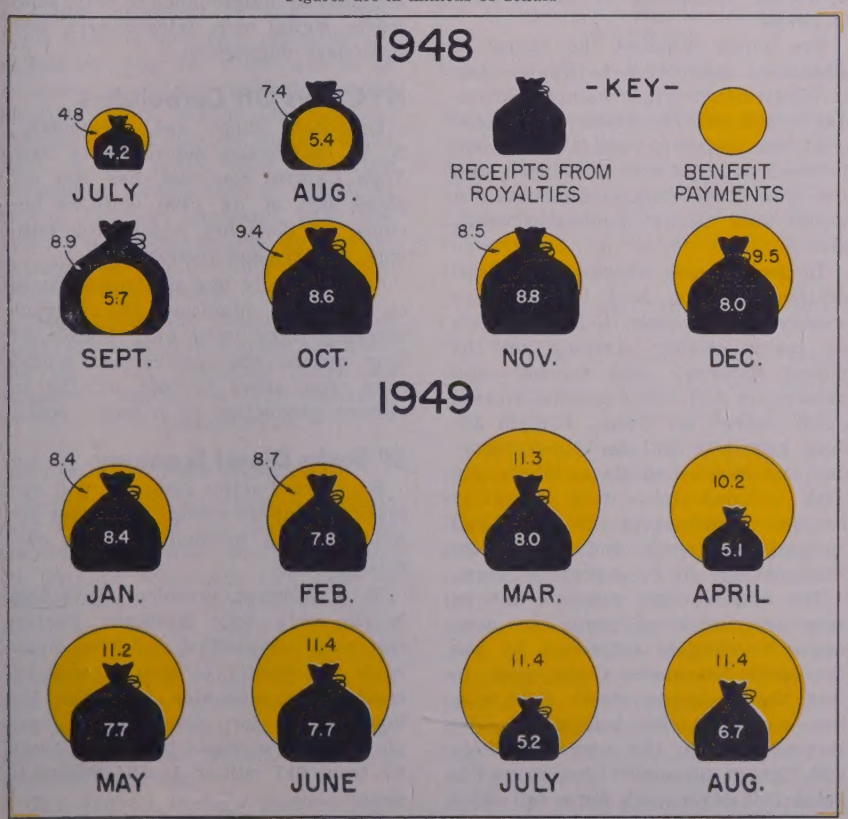
Lesson in Pension Costs—Steel and metalworking companies see a similar danger in the pension plans being pushed by other unions. United Steelworkers, for example, asks for a $125 a month pension. Union estimates the cost at 11.23 cents an hour. Steel companies are advised by independent pension consultants and insurance actuaries that the cost actually would run much higher for most companies.

The cents-per-hour cost is figured on a full work-year of 2000 or 2080 hours. Should the work-year be curtailed by declining business to, say, 1200 hours, the per-hour cost of pensions would increase 67 per cent.

No Contract, No Royalties—Last week, Mr. Lewis was introduced to a new twist to his "no contract, no work" slogan. Some mine operators, who have been trying futilely to sign a new contract with the UMW, decided that until a new agreement is reached they would refuse to pay royalties into the welfare fund.

Miners' Welfare Payments Exceed Royalty Income

Figures are in millions of dollars



Strife or Peace?

Much depends on fact-finding board's recommendations, their acceptance or rejection

FIVE THOUSAND pages of testimony—750,000 words—are being analyzed this week by the President's steel fact-finding board. Presumably this evidence will form the basis for the board's recommendations for settling the steel wage dispute. The panel's report is due at the White House Saturday, Sept. 10.

The recommendations, and their acceptance or rejection, will determine whether industrial peace or war will prevail this fall.

Board members late last week refused to give any clue as to what their recommendations will be. One member emphasized, however, that they would take into consideration the small companies involved in the case. Some observers interpreted this as an indication the board would not recommend a flat increase to be made by all companies.

Mediation Offer Spurned—Near the conclusion of the hearings, the fact-finding board offered to mediate the dispute between the companies and the United Steelworkers. This offer later was withdrawn after industry spokesmen had informed the board that the dispute would have to be settled on a company basis rather than on an industry-wide basis.

Had the mediation offer not been withdrawn by the board, the industry likely would have refused to accept the board's offer. Industry officials believed that acceptance of such an offer would have been tantamount to recognition of the board as a legal agency. The industry contends the board has no reason for being, that law was bypassed in establishing it.

Prospects for Peace — Sentiment among both labor and industry leaders last week was inclined toward peaceful settlement of the dispute.

Privately, industry leaders doubt

that the board will recommend any large concessions to the union. And they privately admit that they might make some small concessions rather than risk a strike.

This belief must not be overemphasized. Several industry men say flatly that they will risk a strike before incurring unsound pension or insurance liabilities or substantial cost increases as result of wage advances.

However, some companies may be willing to grant a modest wage increase, or bargain with their employees on insurance programs.

The majority of companies will refuse to consider the union's pension proposals this year.

Speculation—Consensus of guesses on the board's probable recommendations: A small wage increase and remanding of the pension and insurance demands of the union to collective bargaining on a company basis.

Many observers believe the board will not recommend any definite wage increase and thus give tacit recognition to the varying situations of the companies involved in the case.

Pensions in 1950—While most steel companies are adamant against considering pensions this year, retirement programs may be placed on the 1950 bargaining agenda.

"We would expect to negotiate on pensions . . . . six months from now should the union include that item in the proposals it may present in connection with a labor contract to succeed the present one," says John A. Stephens, U.S. Steel vice president.

Strike Curtails Output

Strike by train crews at Carnegie-Illinois Youngstown plant last Thursday necessitated sharp curtailment of blast furnace, bessemer and open hearth operations. Dispute arose over number of train crews to be used.

Union Violence Charged

Two steelworkers in the Pittsburgh district are accusing their fellow union members of beating them in a membership check. The charges were filed before the National Labor Relations Board by John H. Hunt and William C. Jones Jr. They named CIO United Steelworkers Local 1397.

Mr. Hunt said he was "acting on principle" when he refused to show his union card. He argued against the use of force in getting non-members to join the union.

GM Wage Rates Unchanged

Consumers' price index of the Bureau of Labor Statistics for July 15, released late last month, was down 1.2 points to 168.5 from the April 15 figure, sufficient to justify a 1-cent hourly adjustment downward in wage rates of General Motors employees.

However, the bureau estimated there was a "bias" in the rent component and an understatement of 0.6-0.9 index points in the index, so after conferences with the UAW-CIO the corporation accepted the "bias" and agreed to add 0.8 point to the index, resulting in no change in wage rates for the quarter beginning Sept. 1. The rent component of the index uses a base year of 1940 and the reasons for changes since that time are tied in with after-effects of rent control, premiums and bonuses paid by tenants in many cases, assumption of repairs and maintenance costs by tenants, and the like.

The next review will be made Dec. 1 based upon the index figures for Oct. 15. Present outlook is for an increase from the July 15 calculation which, together with the added rent component adjustment, may effect a 1 or 2-cent increase in wages, starting Dec. 1. The index will need to rise only 0.74 point from the April 15 figure to bring a 1-cent wage boost. Hourly rated employees now are enjoying a total of 5 cents an hour increase due to cost-of-living changes since the present contract was signed.

Senate Passes Pay Minimum

The Senate on Aug. 31 approved legislation increasing the national minimum wage from 40 to 75 cents an hour. The House passed a similar measure three weeks earlier.

A legislative conference will iron out differences which primarily involve coverage exemptions. Most exemptions relate to retail employees and other classifications not directly connected with metalworking.

Sen. Robert A. Taft (Rep., O.) favors the legislation because it will help remedy inequalities in union and nonunion wage scales, particularly in the South. He points out that the measure will be largely of academic interest in most areas where the minimum wage being paid is much higher than 75 cents.

Railroads, on 40-Hour Week, To Hire More Men

"HELP-WANTED" signs may be hung up outside railroad employment offices even though the carriers' business is lagging. This unusual situation stems from the shift last week from a 48-hour week to a five-day, 40-hour week for one million nonoperating employees of the nation's railways.

The move requires the hiring of additional manpower to fill the gap in departments which maintain seven-day operations. The Lackawanna Railroad, for instance, said it would add between 500 and 600 employees, and the New York Central announced it would hire "many" additional workers.

In departments where possible, operations will be held to five days weekly. As a result, ticket windows at many smaller stations will be closed Saturday and Sunday, and passengers will obtain tickets without extra charge on trains. Freight offices generally will be closed Saturday and Sunday at places where less than carload lots were regularly handled on Saturdays. However, full carload shipments and perishables will continue to be moved as usual.

The new working schedule and an accompanying seven - cents - an - hour wage increase is estimated by the Interstate Commerce Commission to cost the railroads about $380 million annually. To help offset this increased cost, the carriers likely will tighten up supervision so as "to get a full day's work for a full day's pay," will avoid overtime pay, and will look for further labor economies through additional mechanization of operations and modernization of roadway and equipment.

Those affected by the new workweek include clerical workers, those assigned to maintenance of way, shop crafts, signal men, telegraphers, and stationary enginemen.

NYC Lays Off Carbuilders

Despatch Shops Inc., Rochester, N. Y., carbuilding subsidiary of New York Central Railroad, has laid off about 600 of its 1200 workers because of declining orders for boxcars, hoppers and gondolas.

The company has sufficient orders on hand to maintain the current working force until next March. If new orders are received, it would take from three to four months to resume production on a larger scale.

SP Seeks Diesel Economy

Southern Pacific Railroad will replace all but its newest and most efficient steam locomotives with diesels by 1960.

T. A. Mercier, president, says this is the only way Southern Pacific can meet competition and keep down costs sufficiently to stop inroads by trucks. He estimates that the 40-hour week for nonoperating employees will increase the road's costs by from $17 million to $24 million a year.

High Housing Volume Aids Metalworking

Last year's record of 931,000 new dwelling starts will be nearly equaled in 1949. More than 4.5 tons of iron and steel products go into the average new house

MORE than 900,000 new houses which the metalworking industry helps erect and furnish will be built this year. About 931,000 were constructed in 1948.

New building, extensive remodeling and replacement needs are booming demand for metal products going into homes, and sales of these items may nearly equal or in some cases exceed last year's record volume. About 9800 pounds of steel are in the average new home today, compared with 8800 pounds in 1938. The metal is used in nails, the furnace, steam pipes, radiators, hot water heating unit, water lines, laundry tubs, kitchen sink, bathtub, washstand, toilet, window frames, metal lath, conduit, flashing, leaders, gutters and household appliances.

June Near Record—Approximately 100,000 new nonfarm dwelling units were started in June, the latest month for which figures are available. In May, 1948, 100,300 were begun, still the record. In the first six months of this year, 450,800 were started, a rate which assures at least 900,000 being built by the end of the year.

Contributing to optimistic construction prospects is the government housing program officially inaugurated July 15. Work will be in progress on 50,000 publicly owned dwelling units within the next 12 months. About 810,000 units will be built in six years. Also bolstering residential construction is the slight decline in costs compared with last year. The accompanying chart summarizes nonfarm dwelling starts over the past two decades.

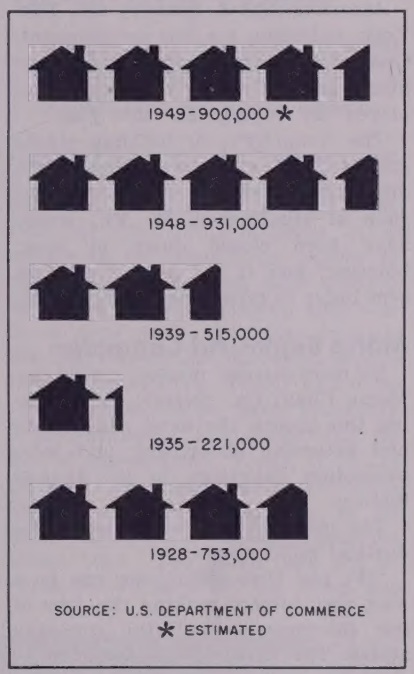
Most important classifications of metal goods used in a house are heating equipment, plumbing items and household appliances. The situation in these three categories is:

Oil, Gas Furnace Needs Up

New home construction, conversion and replacement—in that order of importance — will boost gas and oil furnace shipments this year to record heights. Mechanical stoker sales are falling sharply. For the first six months of this year only 12,282 were sold, compared with 32,351 in the first half of 1948 and 26,665 in the first half of 1947. Shipments of standard solid-fuel furnaces are also declining.

Gas and oil furnace makers have already topped last year's first-half highs. The second half for these producers is expected to be still further above second-half totals in 1948 because seasonal factors are influencing

New Dwelling Starts
(Full Symbol Represents 200,000 Units)



the market more. Before the war most manufacturers of gas and oil units did 60 to 75 per cent of their business during the second half. The following table, based on Commerce Department figures, shows shipment trends in units.

	First Half 1949	First Half 1948	Total 1948
Gas-fired warm air furnaces	83,035	73,365	188,367
Oil-fired warm air furnaces	67,988	65,219	190,598
Solid-fuel warm air furnaces	87,685	149,442	397,973

Conversion jobs are aiding gas and oil furnace makers. Natural gas restrictions will be lifted for an additional 1.3 million potential customers by the end of the year. Some gas unit manufacturers are so rushed they are calling for outside assistance. One producer reports 50 per cent of its sales volume is being manufactured by subcontractors, a proportion without precedence. Oil furnace makers estimate that 4.8 million homes will be in the market eventually for conversion to oil. Prices in some gas and oil furnace lines have been shaded because of competition and reduced costs. Labor efficiency has improved.

Plumbing Potential Huge

A vast market for plumbing fixtures exists aside from new building or replacement needs, Porcelain Enamel Institute says.

There are still about 13 million bathtub-less homes in America and 8 million homes without running water. Roughly one-third of all dwellings in the country do not have private baths. Approximately 1.9 million bathtubs, 2.5 million kitchen sinks and 2 million water closets and lavatories were produced last year.

Figures thus far this year indicate that the 1948 volume probably won't be achieved in 1949, but major plumbing goods manufacturers are stepping up production to meet a reviving demand. First quarter plumbing fixture shipments were valued at $48,330,917, compared with $59,062,147 for the first quarter of 1948.

Appliance Sales Recovering

Sales of all major household appliances except electric refrigerators declined during the first half in comparison with the first six months of 1948. Sales have picked up since June, and the 1949 totals will approach the 1948 records, except for electric refrigerators for which 1948 levels could be exceeded.

Sales index for electric refrigerators (1936=100) averaged 235 for the first four months of 1949. First half-year average in 1948 was 216. Average for all of last year was 221. Unit sales, compiled from Commerce Department figures, of other major appliances are:

	First Half 1949	First Half 1948	Total 1948
Washers	1,321,800	2,309,514	4,317,183
Vacuum Cleaners	1,462,793	1,810,452	3,368,108
Nonelectric ranges	1,015,000	1,916,544	3,531,582

Refrigerator Supply Tight

Refrigerators will be in short supply until October, National Appliance & Radio Dealers Association predicts.

Shortages are primarily due to manufacturers having cut production back too sharply. Larger domestic sizes are particularly short while some manufacturers are as much as three months behind on orders in a few areas. Supplies should be plentiful by December, says the association.

Crosley Boosts Output

A boost in sales and anticipation of further increases in demand have caused Crosley Division of Avco Mfg. Co. to resume two-turn operations in

the production of refrigerators at its Richmond, Ind., plant.

The increased output will provide new employment for 1000 workers, including employees furloughed in June when operations were cut to one turn. The Richmond plant will now employ about 2400.

Revival Sustained

Labor Day appraisals indicate smoother going for industry, barring strikes

WHAT will happen after Labor Day? This is a traditional question of early September, as business men appraise the prospects for fall. Often Labor Day marks a turning point.

In this year's study of the economic road map, industry finds several indicators promising smoother going ahead.

Chief among these is the surprising sustaining power of the economic revival first noted in these pages five weeks ago. Steel mill operations have been rising steadily. Buying continues to increase slightly. No longer can this be said to be protective action against a possible steel strike.

Barring strikes, work interruptions should be nearly over for the rest of the year. Vacations in industry, with consequent production and planning displacements, are far more widespread now than before the war.

Return to more normal economic conditions suggests that the prewar trend of heavier consumer and capital buying in the autumn will be resumed.

Prices have remained stable longer than at any time since the war. This situation is already encouraging business activity.

The rate of new industrial lay-offs is declining sharply. The work force and employment will decrease as students return to school.

Douglas Aircraft Co. believes the commercial plane outlook now is better than that in the last two years.

Third Expect Increase

Business increase in the last half of 1949 over the last half of 1948 is expected by 33 per cent of 665 concerns reporting in a survey by Dun & Bradstreet Inc., New York. A decrease is anticipated by 50 per cent and 17 per cent foresee no change.

In a breakdown of the concerns, retailers are the least optimistic. Sixty per cent of that classification expect a decrease in dollar volume of sales, while 29 per cent predict an increase and 11 per cent see no change.

Of the durable goods manufacturers, 32 per cent expect better business in the last half of 1949 than in the corresponding period of last year, 50 per cent look for a decrease while 18 per cent anticipate no change.

Pickup for Car Builders?

More repair work for independent car builders may result from the 40-hour week for nonoperating railroad employees. The car shops believe carriers will attempt to keep their payrolls down by awarding repair jobs formerly done by railroads to independent car shops.

American Car & Foundry Co., New York, is hoping for this development. Charles J. Hardy, chairman and president, also believes there may be renewed car buying late this year.

The company's car building plants are still all operating despite the dwindling backlog of car orders. The shop at Huntington, W. Va., would have been closed down by now, however, had it not been for a recent order to repair 1000 freight cars.

Morse Begins Ad Campaign

To meet buyers' market conditions, Morse Chain Co., Detroit, is launching this month the most penetrating and extensive advertising and sales promotion campaign in its 51-year history.

The program will be carried in industrial publications.

"We feel that advertising can go a long way toward making the jobs of our salesmen easier," the company states. The campaign is designed to acquaint and reacquaint customers and prospects with Morse's complete line of power transmission equipment.

New Worker Lay-offs Fall

Rate of new industrial lay-offs is slackening steadily, Bureau of Employment Security says.

Sharp declines since mid-July have put new applications for jobless payments at the lowest level since last November. First claims, indicating new unemployment, numbered 259,207 during the week ended Aug. 20. This was a drop of 31,893 from the preceding week. The number of continued claims rose during the period to 2,188,709, an increase of 34,309. This rise is caused primarily by unemployed veterans who until July 25 were under a separate unemployment insurance arrangement. This insurance has expired for most veterans, and those without jobs are now included in the bureau's figures.

For the week ended Aug. 20, according to reports from state agencies, initial claims dropped in 40 states. Minnesota, with a rise of 600 claims, was the only state reporting increases of 200 or more. Unemployment insurance claims as of Aug. 18 had decreased in New York state more than 90,000 from a month earlier.

Airplane Outlook Better

Douglas Aircraft Co. Inc.'s commercial plane outlook "today is better than at any time in the last two years," say officials of the Santa Monica, Calif., company.

Eighteen DC-6 transports are under construction on firm orders or currently under purchase negotiation. The super DC-3 transport is about to make a 10,000-mile demonstration tour for prospective airline customers.

"The company's optimism concerning currently profitable airline operations—especially the relatively untapped potential of air freight—is further indicated by our development of the DC-6A Liftmaster scheduled for first flight in October," a company official states. Three of the DC-6 transports being built are reorders from Philippine, Panagra and Delta air lines. Another five go to United Air Lines. Negotiations are underway for the sale of nine other DC-6 planes.

Temco Modernizes

Four new plants within a plant have been placed in operation at Texas Engineering & Mfg. Co. Inc., Dallas.

The new units are specially equipped shops for the testing and overhaul of propellers, radio and radar equipment, instruments and hydraulic assemblies for military and transport aircraft. Working area is twice as great as Temco's previous facilities, and production capacity is about three times that formerly available.

Mines Seek To Resume Work

Four mining companies in the Park City district of Utah, which were forced to suspend operations July 1 because of declining prices and high production costs, currently are negotiating with union officials on the possibility of resuming production.

The mines are the New Park Mining Co., the Silver King Coalition Mines Co., Park Utah Consolidated Mines Co. and Newmont Exploration Co. Ltd.

The mines were closed after about 700 miners refused to accept a $2.50 wage cut. Improvement in prices of nonferrous metals since July 1 has been a factor in the mining companies' efforts to resume operations.

May License Imports

Canada considers restriction of steel purchases from U. S. to conserve dollars

TORONTO, ONT.

WHILE lacking official confirmation, Canadian steel interests believe the government at the next session of Parliament may take some action toward curtailing steel imports from the United States to conserve dollars. Government officials at Ottawa refuse to comment on the matter, but C. D. Howe, minister of trade and commerce, intimates that such action may be necessary.

Direct action to restrict imports may not be taken until Canadian steel mills are able to meet all domestic requirements and any restriction placed on imports from the United States will deal only with such materials as are produced and available in Canada and will not affect imports of materials not made in this country.

Catching Up with Demand—Canadian steel mills have been making good progress in bringing supply and demand into balance and only a few items are on the short list. Galvanized sheets are the one scarce item. Canadian producers are expected to catch up with demand by the end of this year and by first quarter 1950 they will be looking for business.

For last quarter, quotas have been dropped on most materials, but supplies of all sizes are not readily available from Dominion mills. However, imports from the States have placed consumers in a position where they can obtain steel as required.

May License Imports—It is understood that any new regulation that may be drawn in Ottawa will be along the line of licensing imports. Thus consumers in need of steel, and unable to obtain it from Canadian producers, may bring it in under license from the States.

Lid on Scrap Exports

Government refuses to lift quota for shipments abroad; stays at 40,000 tons for fourth quarter

CONTINUATION of government limitations on fourth-quarter exports of iron and steel scrap is another defeat for the scrap industry in its efforts to be freed from export restrictions. In seeking such freedom the scrap industry is again embroiled in a feud with the steel industry which contends that unlimited exports reduce the domestic supply and make scrap prices higher than necessary.

In continuing limitations, the Office of International Trade, U. S. Department of Commerce, is permitting the fourth-quarter quota to be the same as that for the third quarter, 40,000 tons. The quota does not include No. 1 heavy melting scrap. Exporters may file license applications at any time and must continue to meet requirements for certification of accepted orders and evidence of availability.

Buyers Reluctant—As in the early 1930s, the controversy arises from the steel industry's reluctance to buy scrap in the open market. With domestic demand at a low level, the scrap industry on Aug. 17 formally asked the Department of Commerce to lift its ban on unlimited exports of scrap. This request was hit publicly by Robert W. Wolcott, president of Lukens Steel Co., the steel producers' spokesman on scrap. Ire of the steel industry has been aroused further by the belief that the scrap industry is not making scrap available at prices steel mills want to pay. The scrap industry contends that since domestic steel mills will not purchase their material at prices being asked it is necessary to seek foreign markets or go out of business.

New Alloy Available

A NEW MAGNESIUM-ferrosilicon alloy that promotes the formation of nodular graphite in cast iron is now available from the Electro Metallurgical Division of Union Carbide & Carbon Corp. The alloy contains about 7 to 10 per cent magnesium, approximately 43 per cent silicon, and the remainder chiefly iron. The alloy has been available at a development price of 15 cents a pound.

As widely publicized in the technical press, cast iron that contains graphite in the nodular or spheroidal form has been found to have physical properties vastly superior to those of iron containing graphite in the form of flakes. Nodular iron castings are exceptionally strong and ductile.

Results of a large number of tests indicate that the hazards of a magnesium addition are minimized when this magnesium-ferrosilicon is used to produce nodular iron. Since the alloy acts both as a nodulizing and an inoculating agent, often only one ladle addition is required for the production of ductile iron castings. Moreover, magnesium recoveries have been found to be comparatively high.

The production of nodular iron requires a number of changes in existing foundry practice, and Electromet's service engineers are now assisting foundrymen in their initial use of this ferroalloy to produce ductile iron castings.

For report on Navy research on iron-silicon-magnesium alloy, see p. 82, this issue.

BIG BROTHER: Huge Skylift Giant, made for handling 15-ton loads of steel, demonstrates its power by lifting a little brother in the industrial truck family. Automatic Transportation Co., Chicago, is shipping five of the battery-operated trucks, largest made anywhere, to the United Kingdom for use in a new Welsh steel mill nearing completion

Metal Reserves Higher

Because technological developments permit use of lower grade ores, UN told

U. S. TECHNOLOGY is winning in the race against depleting mineral reserves.

John D. Sullivan, assistant director of Battelle Memorial Institute, Columbus, O., told the UN Scientific Conference on the Conservation and Utilization of Resources at Lake Success, N. Y., that technical developments, particularly in flotation and other mechanical processes, are making feasible the utilization of progressively lower grade ores.

Copper Yield Down—The average yield of copper from a ton of ore today is less than 20 per cent of what it was around 1900, said Mr. Sullivan. The average yield in 1948 was under 1 per cent. There is a like trend in the U. S. for lead and zinc. Once it was impractical to mine lead ore containing less than 5 to 7 per cent of the metal, but now southeastern Missouri mines are profitably producing ore containing 2 per cent. Ore in the zinc producing area of Missouri, Oklahoma and Kansas once contained about 6 per cent of zinc and 1 per cent of lead. Today the combined percentage is down to 4.

Anaconda Copper Mining Co., Mr. Sullivan stated, is now getting a product containing about 60 per cent manganese from a low-grade carbonate ore. During the war a chemical process was developed permitting a 22 per cent manganese ore to be concentrated to 60 per cent manganese. An electrolytic process producing metal 99.9 per cent manganese from sulphate solutions has been perfected. Progress is also being made on production of chromium, titanium, tungsten, gold and molybdenum from lower grade ores.

Situation in aluminum refining is also changing. Formerly only bauxite low in silica could be processed commercially to make aluminum. Now ores as high as 15 per cent in silica can be used.

Trend toward processed iron ores is already well advanced. In 1906, of a total 25.6 million tons shipped from Minnesota, not one ton was concentrated. In 1946, out of 50 million tons, nearly 12 million were concentrated.

Extraction of various minerals out of sea water, sand and industrial waste is practical, and commercial output is increasing. More by-products are now salvaged from mining and concentrating processes.

TOWERS OF STRENGTH: Two 500-ft, 2700-ton steel towers have been completed for the new bridge over the Tacoma Narrows, scene of the big bridge collapse in November, 1940. New bridge, being built by Bethlehem Pacific Coast Steel Corp., will require 16,000 tons of steel for its mile-long stretch

Oil, Gas Fuel Reserves Fall

Vastly increased use of liquid and gaseous fuels may exhaust reserves by the end of the century, Dr. John T. Rettaliata, Illinois Institute of Technology, told the UN conference.

Immediate steps which can and are being taken to economize on fuels include: Use of the gas turbine for coal-burning locomotives and for coal-using power plants; use of more efficient diesel engines, particularly for railroads; burning of underground marginal coal deposits and use of the gases thus released for power.

Fuel-conservation measures now being developed include: Use of synthetic liquid fuels made from coal; extraction of oil from shale; use of nuclear energy; use of solar heating.

Superior Sheet Steel Sold

BORG-WARNER CORP., Chicago, has sold its Superior Sheet Steel Division, Canton, O., to Louis Berkman Co., Steubenville, O. The Canton plant has a rated capacity of 12,000 tons of sheets per month. Production facilities include two 3-high breakdown mills, four 2-high finishing mills, three 2-high cold-pass mills, and galvanizing and terne plate facilities. The plant has been shut down since about July 1 and normally employed about 800. Mr. Berkman says future plans regarding the mill are indefinite.

Lights Outsize Open Hearth

NEW "king-size" open-hearth furnace (company management prefers not to disclose its actual capacity for the time being) has been placed in partial operation by Great Lakes Steel Corp., Ecorse (Detroit), and has been pouring heats for the past two weeks.

It is not being run at full rated capacity pending installation of additional crane equipment to permit handling of two ladles which will be poured simultaneously. For the present it is being operated more or less as an experimental unit and has not been officially added to the plant's capacity. It is equipped for use either with or without oxygen in melt-down and refining periods.

The furnace has been erected adjoining a battery of four 200-ton furnaces which went into operation late in 1938. One of these currently is being rebuilt to double present capacity. The company operates a separate battery of 12 furnaces which continue in service. Full production of the new unit theoretically will raise rated capacity of the entire open-hearth battery by about 16 per cent. The 16 older furnaces are rated at 200-ton capacity but have been pouring close to 250-ton heats in view of the intense demand for flat-rolled steel from automotive customers.

Rated annual capacity of the Great Lakes open hearths is 2.1 million tons and, based upon satisfactory performance of the new installations, this figure will be increased proportionately.

Youngstown Adds Pipe Mill

COMPLETE continuous butt weld pipe mill including finishing floor equipment and two pipe galvanizing units for Youngstown Sheet & Tube Co.'s Indiana Harbor plant in East Chicago, Ind., are being built at the Ellwood City, Pa., and Warren, O., shops of Aetna-Standard Engineering Co. The new mill will enable Youngstown to compete more aggressively for pipe business in the Chicago area.

Aetna-Standard has also recently completed a continuous butt weld pipe mill for Wheeling Steel Corp. in Benwood, W. Va., and has built two continuous seamless mills for National Tube Co., U. S. Steel sub-

sidiary, at Gary, Ind., and Lorain, O. The company has also installed two continuous strip galvanizing lines for another U. S. Steel subsidiary, Tennessee Coal, Iron & Railroad Co., at Fairfield, Ala.

New Buying Ahead?

Foundry suppliers hope improved outlook for casting shops means new orders

ORDERING of foundry equipment is still in a summer slump but the equipment builders note improved sentiment among their customers which they hope will be expressed in increased buying this fall.

New equipment orders index of the Foundry Equipment Manufacturers Association for July declined to 146.6 per cent of the 1937-1939 average from 164.9 in June. In July, 1948, the new orders index reached a 1948 high of 456.3. August ordering started off slowly but the fact that foundries have shown signs of renewed activity keeps the equipment builders' hopes alive.

Conditions in the foundry equipment building industry are similar to those in other capital goods fields. The small independent shops are restricting their buying to replacement needs. Captive foundries and some of the large independents have continued on their modernization programs to effect lower production costs through more efficient operations. Their buying although welcome and necessary to the equipment builders is not enough to sustain operations at high levels. Although the small foundries need modern equipment if they hope to compete in a buyers' market and the equipment builders need their business, lack of capital presents a difficult problem to both interested groups.

Gear Sales Index Falls

Volume for the gearing industry for July was down 15.2 per cent below June. The gear sales index of the American Gear Manufacturers Association, Pittsburgh, was 193.1 per cent of the 1935-1939 average, low point for the postwar period except for the first peacetime month in 1945. The index figure for July, 1948, was 348.4.

Auto Parts Firm Purchased

CLEVELAND Graphite Bronze Co., Cleveland, has acquired business and assets of Monmouth Products Co., same city. Purchase price is being determined on the basis of the net book value of the properties acquired, including Monmouth's inventory of parts, two buildings in Cleveland, machinery and equipment. It is estimated to be about $2.5 million.

Purchase marks another step in Cleveland Graphite's expansion program in which the scope of operations is widened by adding new products. Monmouth's line of automotive products includes: Engine bearings and bushings, clutch plates, clutch and chassis parts. In May of this year, Cleveland Graphite acquired Harris Products Co.

Phantom Orders to Gage Makers

DISTRIBUTION of "phantom orders" for $20,150,000 worth of gages to 12 companies specializing in instrument manufacture was announced last week by John R. Steelman, acting chairman, National Security Resources Board. The latest program is similar to those for machine tools and cutting tools previously announced.

Recipients of the "phantom orders" will need only a telegram from NSRB in the event of a national emergency before starting work on filling the orders. Thus considerable time will be saved since decisions as to the types of gages and the companies that will manufacture them have already been made.

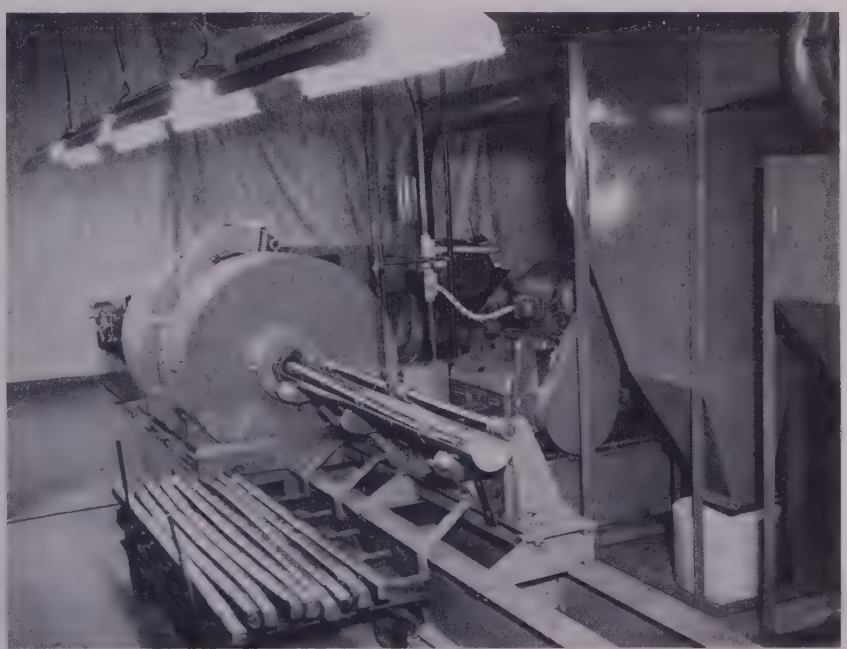
Companies participating in the latest program are: John Bath & Co., Worcester, Mass.; Pipe Machinery Co., Cleveland; Standard Gage Co., Poughkeepsie, N. Y.; Vinco Corp.,, Detroit; Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn.; Detroit Tap & Tool Co., Detroit; Lincoln Park Industries, Lincoln Park, Mich.; Taft-Peirce Mfg. Co., Woonsocket, R. I.; Greenfield Tap & Die Corp., Greenfield, Mass.; Federal Products Corp., Providence, R. I.; Sheffield Corp., Dayton, O.; and Hanson-Whitney Machine Co. Division, Whitney-Hanson Industries Inc., Hartford, Conn.

New Automatic Bar Grinder

AUTOMATIC rough surface grinding and inspection of alloy steel bars is accomplished by the new grinding machine, developed by Wilbur B. Driver Co., Newark, N. J. Machine will turn the bar and at the same time advance it under a high speed grinding wheel. It will remove a uniform amount of stock from all sides of the bar and expose the entire surface for inspection. Amount of pressure can be adjusted to provide a deep or light cut.

Advantages offered in the grinding operation are: 1. Reduction of metal loss by segregation of grinding dust to permit recovery of metallics; 2. improved grinding wheel life; and 3. substantial labor savings by reduction of an unpleasant task for which it is difficult to recruit a suitable work force.

Pictured is a side view of the automatic ejecting device and a dust collector.



Wilbur B. Driver Co.'s automatic bar grinder

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Outlook at eve of American-British-Canadian economic conference is that the U. S. would be amply repaid if it came up with the germ of a more realistic foreign policy

ON THE EVE of the American-British-Canadian financial pow-wow scheduled to start Sept. 6, many Washington observers feel that whatever concessions are granted to the British—and the outlook is that they will be substantial—the United States would be amply repaid if it emerged from the conference with the germ of a more realistic foreign economic policy.

Many government brass hats concur in the view that the anti-trade barrier policy the U.S. set up right after the war rapidly is losing whatever force it may have had. In this period the United States was the only place in the world from which to obtain large quantities of most of the goods necessary to maintain life and to help a prostrate world to its feet.

Secretary Snyder, who will officiate as top man for the United States, says he is not going to press for devaluation of the pound sterling because that is a private matter for the British. But devaluation will be hovering constantly over the heads of the conferees, as will the need for a reduction in British costs and selling prices, so more of British goods can be sold in the U.S. and elsewhere.

Outcome Not Cheering—Outcome of the conference is not expected to make cheering news for American manufacturers. All factors seem to indicate in the long term that American exports will continue to decline and that U.S. imports will remain at the present level or rise. Eventually there should be a balance between the two. Sowing of American dollars abroad may slow this trend for several years, but that is the long-term outlook.

Storm signals are being received here in increasing volume from one of the most significant economic battlegrounds, Latin America. The reason: We continue to ship goods of much higher value to Latin America than the goods we receive in exchange, principal countries there are running out of dollars or are already in heavy dollar arrearage. Result: On the one hand they are tightening restrictions against imports from the United States and on the other they are entering into bilateral agreements with European countries of whose currencies they have plenty. This is the case especially in pounds sterling.

Complaints already are being received from American manufacturers over loss of established markets because of these developments. Typewriter manufacturers complain over loss of their market in Colombia as result of bilateral agreements between Colombia and a number of European countries. Steel manufacturers complain that they are losing their markets in dollar-shy Brazil as a result of new import restrictions. The Argentine situation is just about as unsatisfactory as ever from the standpoint of American exporters. Even Venezuela, with an excess of dollars, is following the trend by setting up import restrictions. Latest South American country to put the screws on U.S. imports in favor of "soft-currency countries" is Peru.

BIG SWEEP: Navy's Terminal Island Shipyard, Long Beach, Calif., will close down. Reasons: Sweeping military economy orders which will necessitate release of 5400 civilian employees in a year's time and a sinking drydock, once capable of holding 14 vessels, would require enormous expenditures to keep in operation

Reason for American Inassurance—One reason why the Americans will enter the conference with less assurance than the British is that Americans have been saying one thing and doing another. The British, as usual, are more consistent in their thinking and acting as to what they want.

Right along the United States has spoken out against bilateral trade agreements and all restrictions to foreign trade, but certain U.S. agencies have taken a leading part in drafting bilateral agreements. U.S. administrators in Germany have had a hand in drafting bilateral agreements between German Trizonia and a number of countries, Colombia, Chile, and Brazil. General MacArthur's SCAP government in Japan has been responsible for drafting similar agreements with Chile, Argentina, Uruguay, Brazil and Peru. While MacArthur thus has put the stamp of approval on dealings with Argentina, the Economic Cooperation Administration continues to keep Argentina in its doghouse.

Netherlands Representative

LATEST of the foreign scientific attaches to be stationed in Washington is Dr. Hans Polak, representing the government of The Netherlands and Dutch industry. His task is to observe and report on scientific and technological progress in the U. S.

Tin Restrictions Off

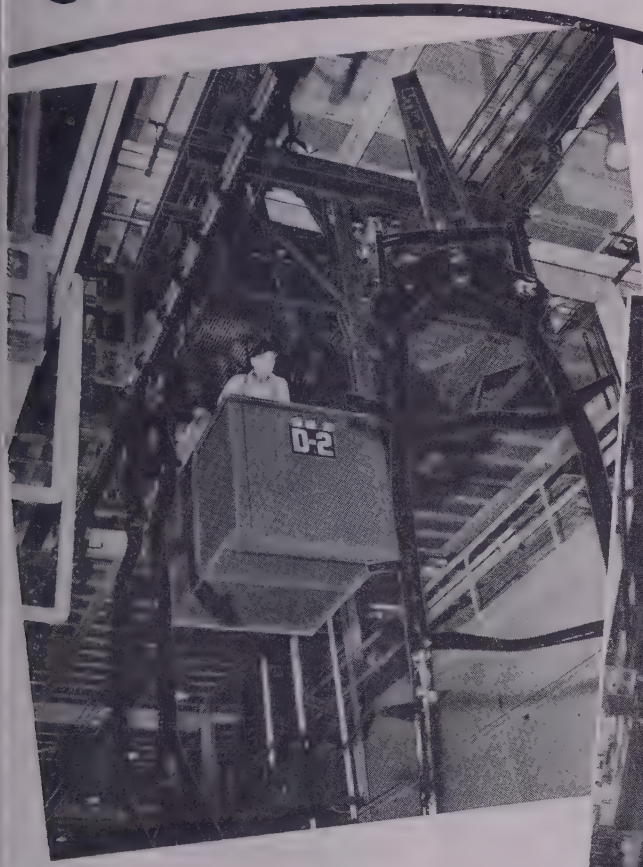
RESTRICTIONS on uses of tin are eliminated in a sweeping revision of Commerce Department's basic tin conservation order M-43 and by revocation of order M-81. Action was in keeping with the department's promise to decontrol the metal as quickly as supplies appeared adequate to meet all industry needs and those for the strategic stockpile.

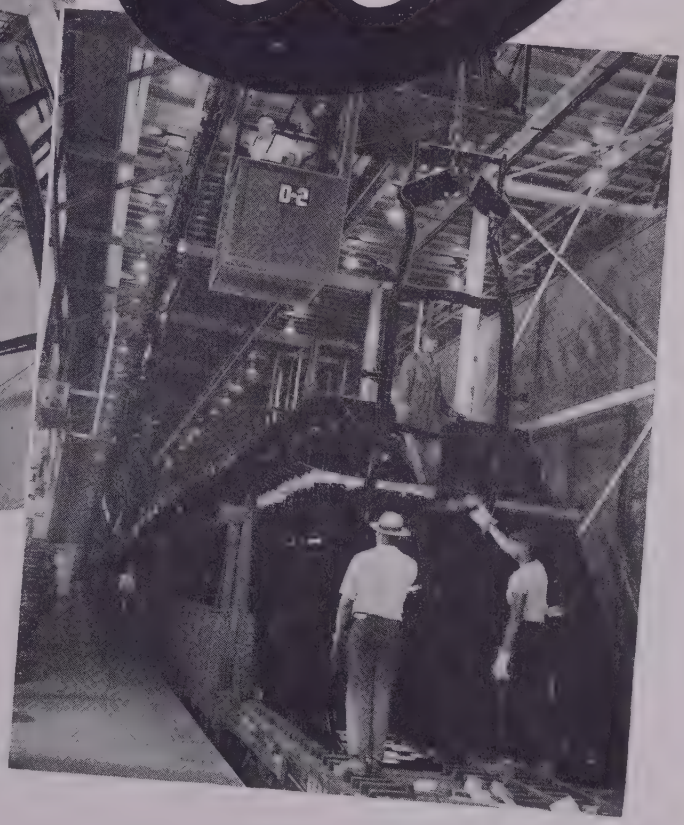
Regulated since early in the war, tin, effective immediately, is made relatively free for importation by private industry by amendment to M-43. Effective date of revocation of M-81 is Dec. 1.

This particular order sets specifications for use of tin in manufacture of cans. Specification restrictions on closures for certain food containers, in order M-43, also will be lifted Dec. 1.

Although end use restrictions of M-43 are eliminated, the general framework of the order remains in effect. Controls that will continue to

CAR LOADING TIME REDUCED 50%





To load 5440 automobile frames per day in railroad cars for transfer to assembly lines, formerly required 748 man-hours of dangerous labor. Since the installation of an American MonoRail specially designed system, this time has been reduced 50% and at the same time furnishing a safe method of performing the same operation.

The equipment consists of 2 special RailMaster cranes operating from cab control with variable speeds of 250 feet per minute for changing location from one car to another, and a micro-speed of 7 inches per minute to synchronize with the conveyor bringing the frames to the car. The jib boom operates at 10 r.p.m. variable speed to permit handling of a frame every 10.6 seconds with perfect safety.

Let an American MonoRail engineer show you how American MonoRail Overhead Handling equipment will pay and save in your plant.

SEND FOR BULLETIN C-1. A 56-page book showing successful applications of American MonoRail Systems.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE CLEVELAND 7, OHIO

be exercised by the Commerce Department are: 1. Allocation of all pig tin; 2. inventory controls on pig tin and all materials containing tin; 3. reports by holders, distributors, importers and users of tin; and 4. import controls on pig tin and materials containing tin.

All pig tin imports by private firms will be maintained under the authorization procedure established earlier in the year to regulate imports of off-grade metals and now expanded to permit relatively free private import of all grades of pig tin. Pig tin containing less than 99.65 per cent of tin, including stocks of these grades held by Reconstruction Finance Corp., and all private imports of pig tin of any tin content, will be allocated to manufacturers without regard to end-use or present allocation quotas. As privately held supplies increase, allocations from RFC stocks will be curtailed and discontinued on a date to be announced.

Latest estimates of world production and consumption, reached at the conference of the International Tin Study Group in London, are: Production for 1949, 170,000 tons; for 1950, 190,000 tons; for 1951, 205,000 tons. Estimated consumption figures are 138,000 tons in 1949; 158,000 tons in 1950; and 162,000 tons in 1951.

Consumers have long complained that because the government is the sole supplier of tin, an artificial price has been placed on the metal. All other nonferrous metals have been subject to trading and have registered price declines this year. Tin still remains unchanged at $1.03 a pound. This price, traders say, is out of line with supply and demand.

Wage Increase Feared

NATION'S businessmen are greatly concerned about the possibility of another round of wage increases, says Secretary of Commerce Charles Sawyer. That is what he told Presidential Assistant John R. Steelman after the secretary completed a personal canvass of the economic views of civic, industrial and business leadership in New England, the East and the southeastern states.

He found businessmen confident but not optimistic; they were not alarmed. But, he reported, "There was everywhere a marked interest in the possibility of reducing current costs of production and distribution."

Businessmen, he said, underlined cost of government, as reflected in tax burdens, as one factor in production costs over which efficient business management had no control. They were emphatic in saying that federal taxes should come down. They want an acceleration of depreciation allowances in federal income taxes and relief from burdensome wartime excise taxes.

Reduce Prices—As for costs, the secretary related, "They feel that the proper way to increase the actual wage of the workingman is to reduce the price of the things he buys, and that while wage increases may be in order in isolated businesses—and probably would be in order at a time when business is constantly picking up—it is a mistake from the standpoint of the businessman and the workingman to increase wages when business has slowed down."

For illustration, Mr. Sawyer told about a talk he had with a small steel fabricator:

"He pointed out that whatever might be the ability of big steel to pay increased wages, his firm and many small firms could not afford to do so since they are now operating at a breakeven or a lower than breakeven point."

In the Southeast, the secretary said, he found much opposition to enactment of the 75 cents minimum wage on the ground that it would be followed immediately by demands from skilled labor for increases in their wages.

Machine Tools—He noted that companies building machine tools and other production equipment reported the least favorable prospects in the areas he visited.

"The machine tool industry's current prospects are still suffering the after effects of the magnificent output of tools and equipment during the war," he said. "Furthermore, a number of current projects by industry for expansion and re-equipping of plants appeared to be held in abeyance until the immediate outlook is clearer.

"The machine tool industry has always been subject to wider ups and downs than other manufacturing, but the equipment industry now has notable long-run cost savings to offer to American industry."

One argument advanced by conferees over the country for relaxation of depreciation allowances in income tax procedure is that purchase of new plant and equipment would be greatly stimulated by such action, Mr. Sawyer said.

He found the principal trouble areas those centers where wartime expansion had been most rapid. In Michigan, he said, the main problem revolves around a number of small manufacturing cities which experienced wartime expansion. In the Upper Peninsula of Michigan the sharp decline in metal mining and lumbering had struck heavily. Particularly hard hit was employment at the copper mines of the region.

The automobile capital of Detroit, he reported, was currently disturbed over strike situations, but he added, "The big question in the long run is how long the automobile industry can continue to operate at its present high levels."

In Ohio, Mr. Sawyer said, "I received from a few manufacturers of machine tools and appliances, indications of improvement in the near future."

New Price-Fixing Brief Time

FEDERAL TRADE Commission granted an extension until Oct. 8 as the time to which individual steel companies may file briefs seeking dismissal of the commission's price-fixing complaints which arose from its attack on basing point pricing.

Back of the action was the repeated plaint of small and large companies that the commission's charges are so voluminous and involved that the companies need more than a little bit of time to properly weigh them and find evidence to answer them.

One company points out that charges fill 20 pages and date back 40 years. In its brief it points out that the task of answering such all-enveloping attacks is a terrific burden on resources not as inexhaustible as the government's appear to be.

Heads Army Supply Committee

RUSSELL FORBES, former commissioner of the Department of Purchase of New York City, has been named chairman of the Committee on Army Supply Methods. He will give professional guidance to the committee composed of the chiefs of the Army's Technical Services, which for two years has been working as a co-ordinating committee for Army supply.

Mission of the committee is to resolve mutual problems of the Army's Technical Services and to produce recommendations for higher decision for methods by which Army supply and service structure can attain maximum efficiency and economy.

Mr. Forbes, who headed a task force on federal supply service in the Hoover Commission on Organization of the Executive Branch of the Government, has acted in similar capacities for five states and ten major cities.

Rain, Politics May Aid Europe's Industry

End of severe drought and favorable political developments, particularly at the Washington conferences, would spur business

FAVORABLE shifts in weather and politics could spur European industry for the remainder of the year.

All Western Europe, but particularly France, is suffering from a drought which has curtailed electric power output, hampered industry and injured farm production. Seasonal autumn rains would bring increased industrial activity.

All Western Europe, but particularly Great Britain, is awaiting the outcome of the trade and monetary conferences beginning in Washington Sept. 6 (see STEEL, Aug. 29, p. 41). Although the discussions will center upon British and sterling area problems, decisions may affect everyone. Western Germany, for example, hopes that the U. S. position on bilateral trade agreements will be clarified. Ruhr industrialists, optimistic because of the election results, believe that all economic restrictions will be lifted from the steel industry by the end of the year. The new Belgian coalition government has the support of industry. The ministry has pledged to keep economic restrictions to a minimum.

French Cost of Living Up

The drought, which boosted power rates and food prices, has raised France's cost of living in the first appreciable advance this year.

General industrial production is now running 30 per cent above the 1938 level in spite of the weather, but output had been expected to improve still more. Coal production for the first half of 1949 was the highest since the record 1930. It amounted to 29.6 million net tons, and the target of 59.4 million tons for the year should be reached. Iron ore extraction will probably fall short of the target. Ore mining is still below 1938. Production of basic steel in France, excluding the Saar, during the first half of 1949 totaled 4,063,300 tons, compared with 3,960,000 tons in the same period last year. Combined output of France and the Saar in the first half of this year was at an annual rate of 12 million tons.

The French locomotive export group which consists of Cail, Paris-Lille, Batignolles - Chatillon and Schneidt has signed a contract with Brazil to build 90 locomotives worth $10.5 million. French manufacturers will also build a $7 million oil refinery plant for Brazil. The unit will have a daily output of 45,000 barrels of crude oil.

During the first half of 1949 about 83 per cent of French imports were covered by exports, compared with a 75 per cent coverage in the same 1948 period. These figures include general exports and imports of goods either shipped or received from foreign countries and overseas territories.

U. K. Output at Full Tilt

Despite Britain's economic crises, production continues at full tilt.

With vacations over, the nation's steel and heavy machinery plants have returned to 100 per cent operation. Demand for plates, sheets and structural shapes assures capacity output well into 1950. Imports of Belgian and French semifinished steel are at the highest level since before the war, and rerollers consequently are more active than at any time since 1938. Their principal product is sheets. Prices of galvanized sheets have been shaded in the home market, but export quotations have not altered.

Machinery exports during the first half of this year totaled nearly $556 million, compared with $116 million in the same half of 1938. The record rate of the first six months of this year promises to continue in this half.

Dorman Long & Co., steel producer in the northeast, is beginning the second stage in its development program. Already $10 million, part of it from ECA sources, has been spent on the first stage. The second part will call for capital expenditures totaling $32 million on work to be completed by September, 1952. This includes a new open-hearth steel plant with a capacity of 11,000 tons of ingots weekly, a new ore-grading plant and the installation of new blast furnace equipment, which will assist in reducing the cost of iron manufacture at the existing furnaces. The construction is part of the national development plan for the steel industry and furthers a trend to concentrate more production on the northeast coast of Britain.

A new agreement for the import of steel scrap from Germany has been negotiated on cheaper terms than hitherto. The volume will reach

GIANT SIZE: Davenport Machine & Foundry Co., Davenport, Iowa, sold two machines like the one pictured to a new French foundry, Societé De Fonderie D'Aluminum & D'Alliages Legers. Its new plant at Arandon, France, will make large size aluminum castings for the manufacture of a four hp aluminum Francais-Gregoire car chassis. Around the model 66A Rollover are (left to right): Charles F. Scherer, vice president and general manager of Davenport; A. G. Hawthorne, vice president, Canadian Foundry Supplies Ltd., Toronto; G. H. Lamp, secretary, Davenport; A. R. Woods, president, Canadian. At controls is Edward Thoensen, general superintendent, Davenport

some 600,000 tons over a period of four months. The price fixed, $24 per metric ton f.a.s., exceeds British domestic rates, but the material is urgently needed. The official German export quotation is $28.50 per metric ton.

Belgian Ministry Pro-Industry

The new Belgian government has pledged to minimize economic restrictions, promote reconstruction, diminish indirect taxes and reduce national expenses. Belgian stock quotations have risen as a result, and business optimism is as high as it has been for months.

Output of steel ingots and castings for the first half totaled 2,336,171 net tons, a 20 per cent boost over the 1,939,603 tons produced during the corresponding period of 1948. Free market export prices have also risen slightly, but they are still below what they were late last year.

Coal and coke output has decreased, but coal stocks at the mines are continually increasing because of a drop in the export rate and in home consumption. Many mines are now operating two or three days a week.

Cast iron foundries, the hardest hit in the metalworking industry, are working only one or two days a week.

Germans Seek More Exports

Western German industry is eager to get higher export allowances and is fighting for a raise of the present annual export quota of 300,000 tons of rolled steel products to about 1 million tons. Ruhr business men hope that the new government will be an effective voice for it in dealing with Allied authorities.

Good business opportunities exist with Scandinavian countries, Holland and Switzerland, but lack of investment capital and exchange restrictions prevent Germany from taking advantage of them. Backlogs of orders on rolled steel products amount to about 2 million tons, against 2.5 million tons at the beginning of the year. Present capacity is reported to be about 550,000 tons monthly.

More vehicles—$180 million worth—were made in Western Germany during the first six months this year than during all of 1948. Passenger car production totaled 37,962; trucks 25,208; busses 1219; wheel tractors 1227; tracklaying tractors 4513. The passenger car increase is mainly due to Volkswagen output, 18,252 were made in the first half. Outlook for the second half is promising. Auto exports are also on the increase.

Allis-Chalmers Axial Compressor Is Key Element in Fastest Wind Tunnel

FIRST disclosure of operating details on the fastest of three giant tunnel installations for studying supersonic flight was made by the National Committee for Aeronautics and Allis-Chalmers Mfg. Co. The 4 by 4-foot tunnel has been in preliminary operation at Langley Aeronautical Laboratory in Virginia for the past year.

New facility has design characteristics making it especially suitable for study of flight at speeds faster than sound. NACA supersonic tunnels at Ames Aeronautical Laboratory, Moffett Field, Calif., and at Lewis Propulsion Laboratory, Cleveland, are probing other phases of the problem that is important to aviation of tomorrow.

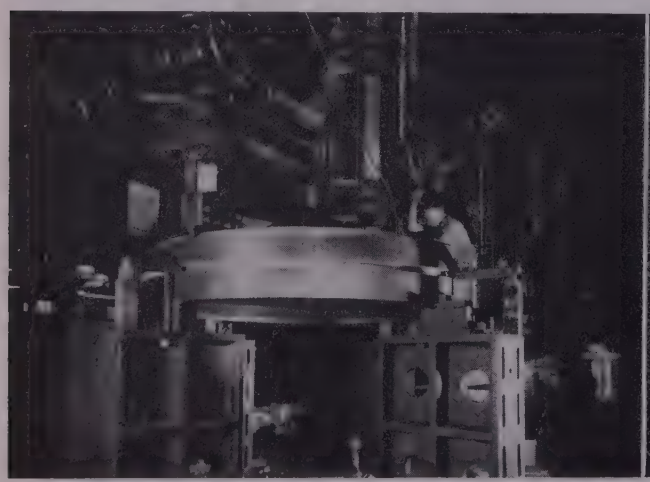
Axial Compressor—Key element of new research unit at Langley is a specially designed axial compressor which generates a flow up to 870,000 cubic feet of air per minute. Believed to be the most efficient device ever built for the movement of air, it was designed and built by Allis-Chalmers in conjunction with NACA Langley engineers.

The seven-stage, 11-foot diameter, 1137-blade compressor operates at tunnel pressures from .25 to 2.5 times atmospheric pressure and requires up to 60,000 hp to drive it. It circulates air through the test section of the tunnel at velocities ranging from 1.2 to 2.2 times the speed of sound.

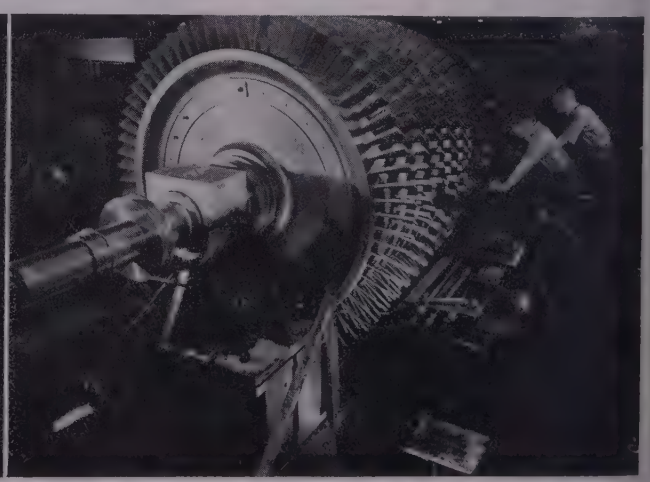
Size of the tunnel compressor—it is 11 times larger in volume of air handled than the largest standard commercial compressor built to date—can be imagined from its weight of 140 tons. Total weight of the blading is about 10 tons. Bladed rotor weighs about 65 tons.

Speed of 560 mph—Tip ends of the rotor blades are about 11 feet in diameter and travel at a speed of almost 560 miles an hour when unit is running at maximum speed. The 12½-foot diameter compressor cylinder, an integral part of the wind tunnel, is split in halves. Each half is mounted on rails so that it can be unbolted and moved back to facilitate internal inspection of the compressor.

Unusual size of the compressor rotor called for construction of seven forged steel disks and two forged steel shaft ends welded together. This was accomplished in a special heating unit with an insulated housing. The need for accurate final balancing of the finished rotor required close machining of disks and shaft ends prior to welding and prevention of warping in welding.



Rotor section of NACA axial compressor in Allis-Chalmers 16-foot boring mill



After blades were inserted in the 870,000 cfm compressor spindle, a final trimming cut was made

Freight Freeze

Rising transportation costs are circumscribing markets for metalworking jobbers

RISING freight rates are freezing distant markets for many jobbers catering to the metalworking industry. The rail hike which became effective Sept. 1 is solidifying the situation still further. Truck and boat rates are also rising.

For example, Japan Co., a Cleveland metal finisher specializing in industrial japanning and enameling, finds its marketing area circumscribed to nearly county dimensions. Lower freight rates formerly permitted it to do business within a 500-mile radius of its headquarters. The company has 65,000 sq ft of manufacturing area at its disposal, but is paring operations to use only 25,000.

Competition Strong—Since the war many small finishing companies have been formed which are underbidding larger, longer established firms because of a freight advantage, says Harry Forsberg, Japan Co. president. Freight is a big factor with finishers because it is relatively easy for small shops to spring up in many areas. Manufacturers of end products, whose capital requirements are generally larger than a jobber's, haven't quite the same problem of freight competition.

Japan Co. has been particularly hard hit in the East where radio manufacturers are turning to closer plants for their metal finishing work. Only sizable "foreign" account the company has is a Pacific Coast job which is being shipped through Cleveland anyway. Finishers have never made a practice of absorbing freight but Mr. Forsberg thinks they might in some instances if the O'Mahoney pricing bill is passed. Only larger jobbers could afford to do this on volume orders.

West Hit by Freight Hike

Certain geographic areas, as well as particular types of industrial activity, are being especially hard hit by rising freight rates. Many West Coast manufacturers face a new inch in competition with eastern manufacturers in eastern markets as a result of the new rail boosts.

Hardest hit are metal fabricators and producers of heavy durable goods like water heaters, furnaces, machinery and industrial equipment. Some of these manufacturers had begun invading middle western and eastern areas. The trend of eastern companies to establish Pacific plants may now be reversed. West Coast firms could be forced to find production facilities east of the Mississippi. Manufacturers who depend on eastern sources for part of their raw materials have already begun setting up eastern plants.

Many Coast producers find themselves for the moment in a better competitive position pricewise in their area than the eastern makers of the same goods, but the Pacific manufacturers fear that their business will be kept localized to a greater extent than that of longer established competitors in other areas. West Coast costs will rise if goods must be made in smaller volume than anywhere else.

Below Zero Starting

BATTERIES that will crank engines of tanks, trucks, busses and other vehicles in temperatures as low as 65° F below zero are being produced by Willard Storage Battery Co., Cleveland. They are for the government and some highly specialized civilian applications.

Two new developments enabled Willard to create the new batteries: Willard research men developed a new active material for use in battery plates. Company engineers devised a means of building at commercially practicable costs, strong, exceptionally thin plates which permitted use of many additional plates and provided an increase in plate area exposed to the action of battery acid.

Smog Control Planned

BETHLEHEM Pacific Coast Steel Corp. will spend $400,000 to control smog from three open hearths at its plant in Vernon, Calif. R. S. Coulter, chief combustion engineer of the Bethlehem Steel Corp. subsidiary, says electrical precipitators will be installed to trap precipitate matter in waste gases. Although other methods are cheaper the corporation believes this method to be most efficient in halting smog.

Mr. Coulter estimates it will take 17½ months to get the control system into operation.

Punch Press Safety Clinic

PUNCH press safety clinic will highlight the meeting of the Chicago chapter, Pressed Metal Institute at the Graemere Hotel, Sept. 14. On display will be all types of punch press safety devices and exhibits by the National Safety Council, insurance carriers and governmental agencies covering safety posters, films and programs. Exhibit will precede the meeting and an open forum where fabricators can voice their experiences, opinions and questions will close the proceedings.

CALENDAR OF MEETINGS

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, National Association of Corrosion Engineers: Short course in corrosion at University of Texas, Austin. Association headquarters are at 919 Milam Bldg., Houston.

Sept. 14-16, Porcelain Enamel Institute: 11th annual forum, Ohio State University, Columbus, O. Institute headquarters are at 1010 Vermont Ave. N.W., Washington.

Sept. 15-16, Associated Industries of Cleveland: Fall clinic on industrial relations, Carter Hotel, Cleveland. Group's headquarters are in the N.B.C. Bldg., Cleveland.

Sept. 18-21, American Chemical Society: 116th National meeting, featuring a symposium on titanium, Atlantic City, N. J. Society headquarters are at 60 E. 42nd St., New York.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 23, Malleable Founders' Society: General meeting, Hotel Cleveland, Cleveland. Society headquarters are in the Union Commerce Bldg., Cleveland.

Sept. 25-28, Controllers Institute of America: 18th annual meeting, San Francisco. Institute headquarters are at 1 E. 42nd St., New York.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibit committee.

Sept. 26-28, American Mining Congress: Metal Mining Convention, Spokane, Wash. Congress headquarters are in the Ring Bldg., Washington.

Sept. 26-28, American Management Association: Personnel conference, Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

Sept. 27-30, American Society of Mechanical Engineers: Fall meeting, Hotel Lawrence, Erie, Pa. Society headquarters are at 29 W. 39th St., New York.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 129 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

The weight's in the load and not in the truck when frames, body panels, fenders, wheels and other truck structural parts are made of N-A-X HIGH-TENSILE. And while affording weight savings of up to 25% in section, the high physical properties of N-A-X HIGH-TENSILE insure superior strength and increased resistance to fatigue, corrosion, abrasion and denting.

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Unit of National Steel Corporation

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Labor Day watched as possible turning point in new and used car sales which have been holding up better than anticipated. August output may establish record

DETROIT

LABOR DAY is being watched as the possible turning point in sales of new and used cars which in most sections of the country have held to a high level beyond what anyone had forecast. Normally the bellwether of any major shift in buying trends, used cars have held up surprisingly well this summer, even firming a little in price several months ago. A number of dealers and used car lots have predicted a drop in the price line of as much as 30 per cent this month and the tendency of new car outlets is to maintain a policy of liquidity on used vehicles. Average prices have dropped less than $100 since June and are still above what might be considered normal in pre-war years.

Deliveries of new cars continue at an exceptionally high level and there appears to be ample support left in the market. Most models can be purchased without too much wait, except perhaps for Chevrolet, and even there the situation is spotty. On the production front there has been no letup in high schedules throughout the industry, Kaiser-Frazer being the only exception. When the final figures are in, August will see a record outpouring of close to 675,000 cars and trucks, eclipsing even the best month of 1929. Trucks and busses continue under last year's pace, but this decline has been more than made up by accelerated assemblies of passenger cars.

Still Going Strong—Parts releases so far indicate no letup for September, but the industry is overdue for a tapering off and it could come suddenly. Manufacturers are indisposed to be caught with any large inventories of parts and have geared releases closely with production. Steel is an exception, since the danger of a steel strike has spurred most buyers to lay down all they can to carry through any interruption to mill schedules. With nearly all manufacturers taking in more steel than they are fabricating, the sustaining effect on steel production is only natural.

On this score an amusing incident occurred the other day at a press conference held by sales and advertising officials of one prominent car builder. Reviewing production accomplishments with reporters, one of the advertising men pointed out that assemblies might be much higher except for the "steel shortage." To anyone who knew the real situation this comment was ridiculous, but it made several of the papers, to the complete consternation of administrative officials at the plant in question. A number of people were "told off" over this slip.

Most Operating at Capacity—Actually, most plants have been operating at virtual capacity, even taking into account postwar expansions. The August total of 675,000 completed vehicles is the equivalent of an annual rate of 7,500,000, allowing for holidays and a shutdown of several weeks for model changeovers, and the latter are now pretty much things of the past, since model changes can be sandwiched into regular production without the loss of much more than a week to make the complete shift. Even the most optimistic planners never looked for industry operations at anything beyond 7,500,000 annually. Such a stratospheric total will not be realized in 1949 but some observers profess to see 6,675,000, which will break all records.

It may well be that August of this year will set a production mark not to be beaten for a long time to come. Certainly few will crawl so far out on a limb as to predict that 1950 will equal the 1949 achievement, for the simple reason that continuing strong sales this year have been accounted for by filling the remaining vacuum in postwar demand. There is bound to be a leveling off in the next year and perhaps for the next two or three years. The truck and bus industry seems to prove this point. Truck sales in the first seven months of this year totaled 768,425, off 114,000 units from the same period in 1948 or about 13 per cent, while motor bus output dropped from 8693 to 3991, a decline of 54 per cent.

As a consequence selling effort in these fields has been intensified tremendously and new models have been appearing more frequently, particularly in the truck end of the busi-

FIRST new GM "H" model was driven off assembly line at Pontiac, Mich., by M. D. Douglas, general manager of the Truck & Coach Division. Other GM officials shown, left to right: J. E. Johnson, sales manager of the Truck Division; P. G. Dempsey, superintendent of truck production; and J. S. Falberg, factory manager. The new line of heavy duty trucks includes 61 basic models

ness. General Motors, for example, is placing considerable emphasis on new features of its latest "H" line of truck models. Thus the large diesel-powered units have exceptionally short bumper-to-rear-of-cab dimension—117 inches against the former 131 inches—to provide greater payload when used as a straight truck and allowing longer semi- and four-wheel trailer combinations without violating 60-foot overall length limitations of many states. The 14-inch saving was accomplished by reducing the space between the bumper and grille, and grille and front axle, by re-engineering the cab dash into the form of a bay to allow the engine to extend a short distance into the cab interior.

Dodge Offers New Trucks—Dodge has initiated production on a new series of truck models, although formal announcement has been deferred until stocks of preceding models are worked off. They will feature elimination of frills like chrome-plated grilles, greater ruggedness and refinements in the interest of driver ease and comfort.

Saving feature of faltering truck demand is a fairly good market for lighter types of commercial vehicles, such as panel delivery, "Route Vans" and the like.

Output of motor coaches has dwindled to near nothing, only 449 having been built in July, compared with 1065 a year ago. General Motors for a time suspended motor coach output completely and has been scouring the country trying to round up enough small orders to permit resumption of assembly schedules. Similarly, Ford production of coaches has been trivial. Explanation for the drying up of this business is the falling off in passenger traffic for all types of carriers and the squeeze in which operators find themselves between high operating and maintenance costs and frozen rates.

Studebaker Rolling — Studebaker assembly lines have accelerated to practical capacity and with its "next look" passenger car models rolling at better than 1200 per day, dealers are already well sampled. Announcement has been made that no change will be effected in prices, despite numerous engineering and style modifications. At the current level of production there is doubtless some margin for a downward move in prices if the competitive situation eventually so dictates. Truck production at South Bend is running at better than 1000 per week.

K-F To Resume — Kaiser-Frazer is scheduled to resume assemblies this week on the basis of 325 jobs a day, after a two-week closing to adjust inventories, principally of completed cars jamming the lot at Willow Run. August total was close to 5200, practically all Kaiser models, compared with year's high in May of 9600. K-F lost something over $8 million in the first half of the year and unless operations have been consolidated from the earlier break-even point of 450 cars a day the company is still running in the red. Prospects for introduction of a smaller and lower-priced model would appear dimmer because of the heavy capital investment required.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351*	489,736
August	675,000*	478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

*Preliminary.

Estimate for week ended:

	1949	(Same Week) 1948
Aug. 13	144,317	112,342
Aug. 20	149,359	113,324
Aug. 27	152,312	100,699
Sept. 3	154,000	101,879

Estimates by Ward's Automotive Reports

Sales of 1949 Nash cars from Aug. 10 through Aug. 20 were the highest for that period in 20 years and climbed 23.7 per cent over the same ten-day period last year. Showings of 1950 models are planned for later this month.

Packard has declared dividend of 25 cents a share, bringing total payments this year to $7.5 million, or 50 cents a share on 15 million shares of common stock outstanding. Last year stockholders received a total of 35 cents. Assemblies currently are somewhat over 700 per day and August is likely to go into the record as the best year in company history.

Willys-Overland also is planning to resume operations this week after a two-week closing. August output approximated 5900. The company is working on an order for 524 four-wheel-drive trucks, 279 jeeps, 74 station wagons and 50 trucks, along with a substantial quantity of spare parts, for shipment to Turkey. Awarded under provisions of U. S. aid to Greece and Turkey, the shipment will be worth $1,355,757.

To Produce "Cold" Rubber

GOODYEAR Synthetic Rubber Corp. has completed conversion of 24 of the 48 reactors at a government-owned plant in Houston for annual production of 30,000 long tons of "cold" rubber. The material is polymerized at a temperature of 41 degrees, while the conventional GR-S synthetic requires a temperature of 122 degrees. Conversion of half of the plant's reactors, therefore, required a considerable amount of refrigeration equipment.

Cold rubber is claimed in some quarters to increase tire mileage as much as 30 per cent, although Goodyear research experts are maintaining a conservative attitude in stacking it up against natural rubber. Practically all of the work done with cold rubber to date, they explain, has been aimed at developing a standard product. Experience has shown that on small passenger car tires, tread life is increased materially over conventional GR-S treads, however, cold weather skidding is increased, and tests on hot weather cracking are not yet conclusive.

Ford Sponsors Safety Campaign

FORD Motor Co. is offering $100,000 in prizes in a contest to be held this month and next, seeking to interest motorists in having their vehicles checked mechanically from a safety standpoint. Awards include 25 new cars, five trucks and a number of savings bonds.

Ford To Boost Western Buying

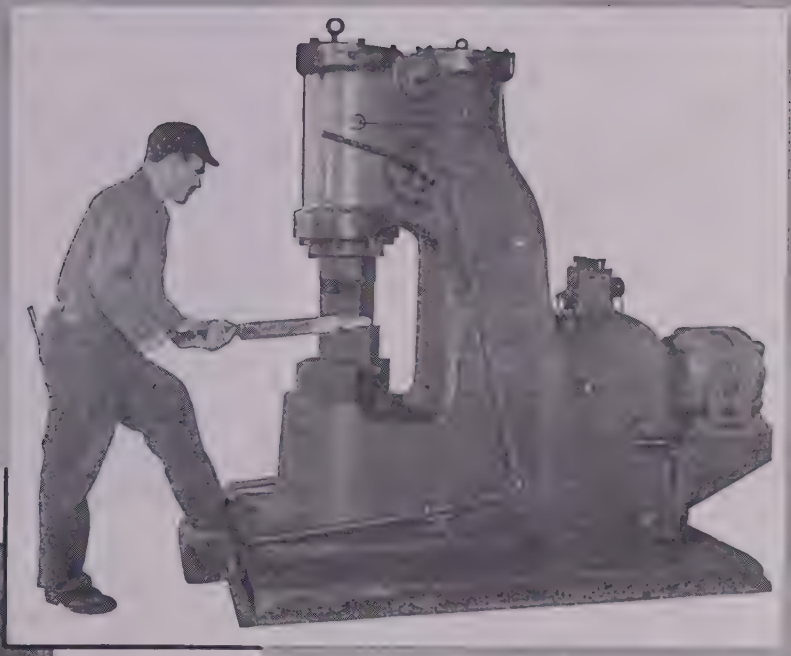
FORD Motor Co. last year purchased more than $45 million of parts manufactured on the West Coast, according to Arthur S. Hatch, western regional sales manager.

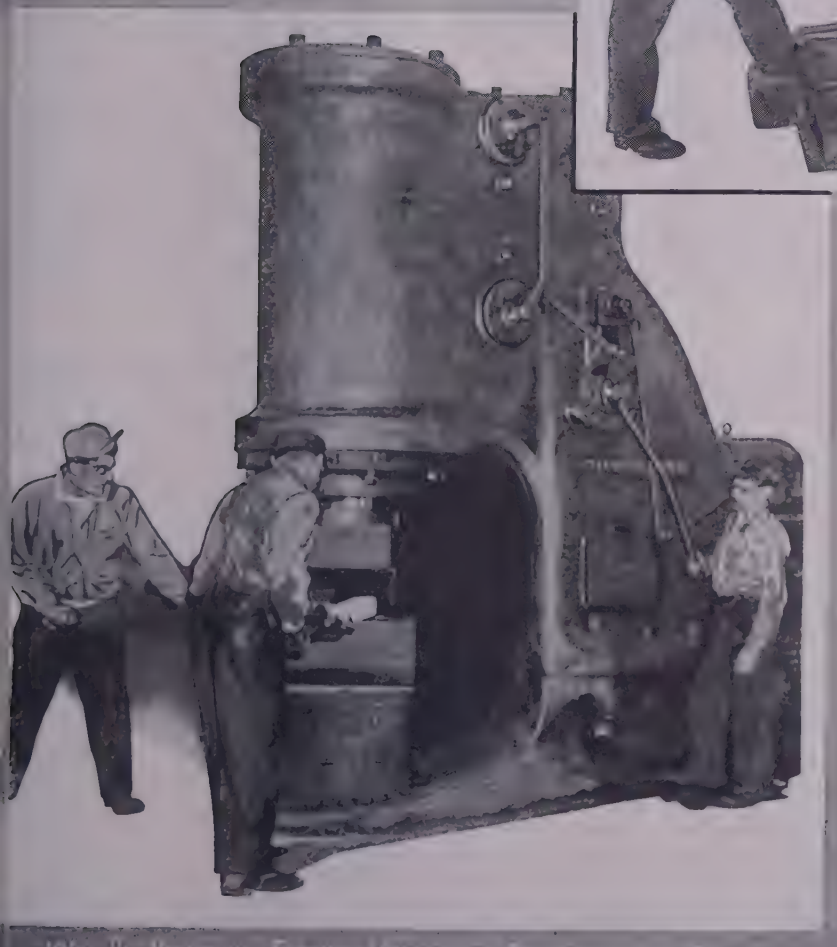
Expansion of regional purchasing in the West will be undertaken as soon as eastern automotive mass production methods are duplicated in western plants. For instance, Ford would welcome a frame plant, and "the opportunity to buy tail pipes and mufflers in the West," Mr. Hatch says.

HAMMER-BUILDERS SINCE 1897...

CHAMBERSBURG

PNEUMATIC FORGING HAMMERS





Offer more forging output per hour, at lower cost per piece, than any similar hammer available. Completely self contained -hammer, motor and compressor - in sizes from 200 lbs. to 5000 lbs. Write for Bulletin

MBERSBURG ENGINEERING CO., CHAMBERSBURG, PA., U.S.

Booked to January

Permanente Metals also has backlog of orders for electrical conductor output past Jan. 1

PERMANENTE METALS Corp., Oakland, Calif., has booked orders for all electrical conductor production scheduled up to Jan. 1, 1950, at the Newark, O., plant it purchased in June from the government. In addition there is a backlog of demand extending beyond Jan. 1.

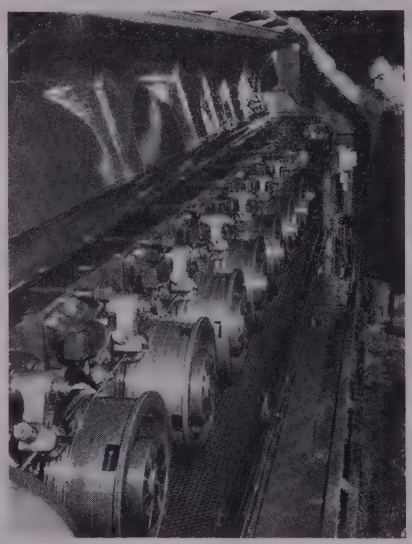
Permanente Metals, of which Henry J. Kaiser is president, purchased the plant to produce aluminum rod, bar, wire and cable, and started deliveries of electrical conductor in July. The Newark mill was purchased for $4.5 million, with an initial cash payment of $450,000 and the rest to be paid over 20 years. Installation of the most modern commercial rod and bar and wire and cable manufacturing facilities will result, when completed, in an additional investment in the plant of approximately $4.5 million, Permanente Metals says.

The electrical transmission lines to be built througout the country, in connection with expansions estimated at $7 billion to $9 billion over a three-year period by the utilities industry, offer a sizable, continuing outlet for aluminum cable, the company believes.

Since acquisition of the Ohio plant, Permanente Metals has purchased three other government aluminum plants, completing the company's ownership of all plants it operates. The newly purchased plants are: Alumina plant at Baton Rouge, La.; and Mead aluminum reduction plant and Trentwood rolling mill, both at Spokane. Approximate original cost of the three plants was $91 million. Permanente Metals bought them for $36 million under a purchase agreement effective July 1, 1949, providing for a down payment of 5 per cent and for payment of the balance over a period of 25 years at 4 per cent interest. For the national defense stockpile the government will accept from Permanente Metals, in lieu of cash to meet the down payment of $1.8 million, plus interest and rentals payable prior to June 30, 1950, 24 million pounds of specified grade aluminum pig or ingot at the prevailing market price, or a total of $3,840,000.

On July 1, Permanente Metals owned and operated plants with an approximate cost of $138,110,000 and a book value of $50,813,000. These do not include the inactive magnesium plant at Permanente, Calif., with an original cost of approximately $15 million.

Permanente Metals has just completed its ninth year of operations and its third year in the aluminum business. From the time the company became one of the nation's three producers of primary aluminum, the management has been steadily building Permanente Metals toward complete integration of operations. The company has achieved its aim of twice as much finishing capacity as basic material production capacity. It now has rolling and fabricating facilities to produce 41 million pounds of finished products a month, compared with its capacity of 22 million pounds of aluminum pig.



INSIDE STORY: Interior of one of the wire drawing machines in the new aluminum bar, rod, and cable plant of Permanente Metals Corp., Newark, O. Permanente has made record time in putting $4.5 million worth of such equipment into full production for the nation's power facilities

During the company's fiscal year ended May 31, new high records were set for production, sales and earnings. Net sales of aluminum, chemicals and refractories totaled $73,669,182, and net earnings were $12,023,374.

Reynolds' Agent to Oil Industry

BECAUSE the petroleum industry has shown considerable interest in possibilities of aluminum, Reynolds Metals Co., Louisville, Ky., has appointed L. E. Pennington as Reynolds representative to the industry. Mr. Pennington's headquarters will be 310 Thompson Bldg., Tulsa, Okla.

Reynolds reports that pilot installations of cross-country pipelines made of aluminum already have proved that the light metal can be welded and installed for this service without leakage. Company also reports activity in use of aluminum pipe for exploratory work and for lines in rugged terrain.

Mr. Pennington has done metallurgical and engineering work for Henry Vogt Machine Co., Louisville Drying Machine Co. and Reynolds Metals.

Melting Facilities Resold

STEEL MELTING facilities at Crucible Steel Co. of America's Park Works, Pittsburgh, sold early this year to Deere & Co., Moline, Ill., have been resold to M. N. Landay Co., Pittsburgh. The facilities include four 50-ton basic open-hearth furnaces and two 10-ton electric arc units, rated at 1200 tons per month. Property consists of about 150,000 square feet and is serviced by Pennsylvania Railroad.

Two months ago M. N. Landay Co. acquired the rolling mill facilities of Phoenix-Apollo Steel Co., owned by a syndicate of 25 metalworking concerns. As in the case of the recent purchase of melting facilities at the Park Works, it is probable the rolling mill facilities at Apollo will either be sold to some foreign country or dismantled for sale as scrap, thus making room for stamping or other metalworking operations. Efforts are being made to attract concerns to the area on the basis of substantial savings in freight because of nearness to steel source.

To Make Jarecki Valves, Fittings

VALVES and fittings formerly manufactured at the Jarecki Mfg. Co. plant in Erie, Pa., will be manufactured at the Tulsa, Okla., plant of H. K. Porter Co. Inc. The 300,000-sq ft of floor space at the Jarecki plant was larger than the company needed.

Ryan Gets $1 Million Contract

MILLION dollar Air Force contract has been awarded Ryan Aeronautical Co., San Diego, Calif., to continue development and fabrication of an additional quantity of Ryan XQ-2 remotely controlled, jet-powered aerial target planes. Original contract for the Ryan robot planes, signed more than a year ago, was for about $2 million. Since the XQ-2 is to be used in target work with the latest combat planes, it should be capable of performance approximating that of a modern jet fighter. It is less than one-half the size of standard jet fighters.

Briefs . . .

Paragraphs on developments of interest and significance within the metalworking industry

Magnesium Association moved its New York offices to Room 307, Chanin Bldg., E. 42nd St.

—o—

Russell Mfg. Co.'s president, G. M. Williams, is negotiating to open a branch plant in Bennettsville, S. C., for the Middletown, Conn., company. Middletown's largest industry, Russell manufactures brake linings, clutch facings and transmission and conveyor belting.

—o—

Landis Tool Co., Waynesboro, Pa., manufacturer of precision cylindrical grinders appointed C. F. Bulotti Co., San Francisco, distributor for northern California and western Nevada. Another exclusive distributorship went to Lang Co., Salt Lake City, Utah, for Utah and surrounding portions of Idaho, Wyoming and Nevada.

—o—

Mechanical Industries Inc., a newly formed engineering company whose activities will be limited to industrial ventilation, smoke, dust and fume control, has its headquarters in the Frick Bldg., Pittsburgh. M. I. Dorfan is president and general manager.

—o—

Amperex Electronic Corp., Brooklyn, N. Y., appointed Caine Sales Co., Chicago, as sales representative in Illinois, Indiana and southern Wisconsin.

—o—

Azed Inc., a new corporation owned jointly by Poor & Co., Chicago, and Acme Steel Co., Riverdale, Ill., will engage in research, manufacture and sale of products and processes for all phases of application and secondary treatment of zinc surfaces. Company will serve zinc electroplaters, hot dip galvanizers and zinc base die cast manufacturers and finishers. Azed offices are at 80 E. Jackson Blvd., Chicago.

—o—

Reed Engineering Co., Carthage, Mo., appointed Blueweld Inc., Milwaukee, representative in Wisconsin and Minnesota for the Reed line of turning rolls and welding jigs for automatic welding.

—o—

Pioneer Steel Ball Inc., Unionville, Conn., has increased its range from ⅜ inch to ¾ inch. The installation of new ball processing equipment enables the company to offer carburized steel bearing balls from 1/16 to ¾ of an inch. Pioneer also manufactures bronze balls, stainless steel balls, burnishing balls and other metallic shapes for use in burnishing or in tumbling barrels.

—o—

Westinghouse Electric Corp. has developed a small size electric milk cooler to serve farms with fewer than 10 cows or to cool cream at larger dairies. The Cooloret can cool three 5-gallon or two 10-gallon cans of milk or cream from 90° F to 50° F in one hour.

—o—

Oliver Corp.'s Battle Creek, Mich., plant workers were presented with the President's Award in recognition of their outstanding safety and good housekeeping record. The award was a result of the record made by the farm equipment company for the two-year period ended June 30.

—o—

Westinghouse Electric Corp.'s new Special Products Development Division will conduct market surveys, recommend action on new product lines and carry on "pilot plant" work on new products. Frank W. Godsey Jr. heads the division which absorbs the New Products department.

—o—

Logansport Machine Co. Inc., Logansport, Ind., has appointed William E. Summerbell Co., DuPont Circle Bldg., Washington, as its representative in that city.

—o—

Gibson Electric Co., Pittsburgh manufacturer of electrical contact assemblies, appointed John D. Tebben & Co., Detroit, sales representative for Michigan and Toledo, O.

—o—

Hauser Machine Tool Corp., Manhasset, N. Y., was appointed exclusive U. S. factory representative of Tornos Works Ltd., Moutier, Switzerland. Entire line of Tornos high-speed precision wood-screw and cam shaping machines and accessory cam-making equipment becomes available in the U. S.

—o—

Parkersburg Rig & Reel Co., Parkersburg, W. Va., received a Defense Department contract for a steel tank costing $197,100.

—o—

William F. Klemp Co. opened its new plant at 7700 Wallisville Rd., Houston. The plant, a wartime part of Howard Hughes' strut facility in Texas, will produce electroforged open steel grating and treads, Hexteel heavy duty surface armor, Flexteel, Klemp's new open steel conveyor belt, and other products.

—o—

Glenn L. Martin Co., Middle River, Md., airplane manufacturer, will make outer wing panels, stabilizers, fins, nose and tail section fuselages and spare parts for Grumman fighter planes. Grumman Aircraft Engineering Corp., Bethpage, N. Y., let contracts for $6,651,000.

—o—

C. J. Tagliabue Corp., wholly owned subsidiary of Weston Electrical Instrument Corp., Newark, N. J., appointed these district sales representatives: E. A. Thornwell Inc., Atlanta; Ranson, Wallace & Co., Charlotte, N. C.; Ambos-Jones Co., Cleveland; Butler & Land, Dallas; Curtis H. Stout, Little Rock, Ark.; Geeseka & Pinkney, Minneapolis; Joralemon, Craig & Co., Philadelphia; J. E. Redmond Supply Co., Phoenix, Ariz.; Riddle & Hubbell, Tulsa, Okla.; and Lynn Elliott Co., Houston.

—o—

Detrex Corp., Detroit, has established an improved type of consulting arrangement: T. J. Kearney, chief engineer in the Equipment Division, will head industrial product engineering, estimating and customer field service for the metal cleaning equipment and chemical cleaner firm.

—o—

Continental Equipment Corp., New York, has been appointed distributor by By-Buk Products Co., Jacoel Products Co., Philadelphia, and Oxygen Products Co. Continental will distribute Scotch-Lite sheets, cable splicing machinery and portable oxygen equipment for the companies.

—o—

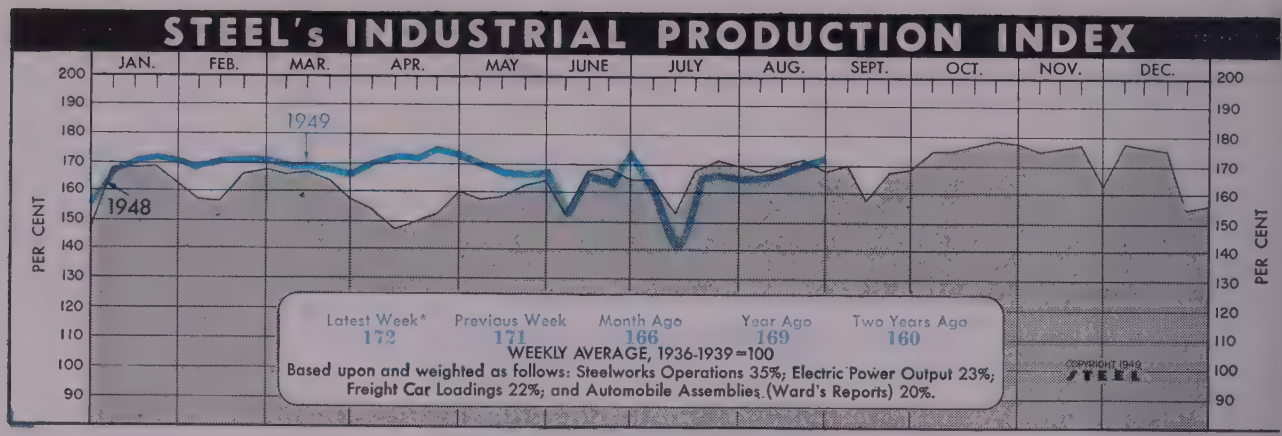
Marathon Electric Mfg. Co., Wausau, Wis., bought the controlling stock interest in Burke Electric Co., Erie, Pa., for an undisclosed sum. Marathon, maker of generators, motors and other products, acquired the Erie firm to expand its line of sales.

—o—

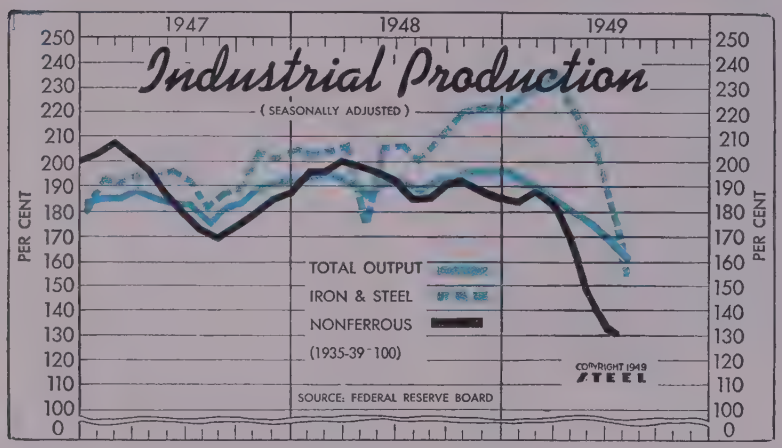
Associated Commodity Corp., New York, has been designated by the Belgian governmental agency, Office d'Aide Mutuelle (Oma), Brussels, as exclusive agent in North and South America for disposal of Belgian surplus materials and equipment.

—o—

California State Chamber of Commerce has issued a booklet, "California's Industrial Resources—a Summary of the Major Factors in Plant Location," which presents salient information for industries considering locating in that state.

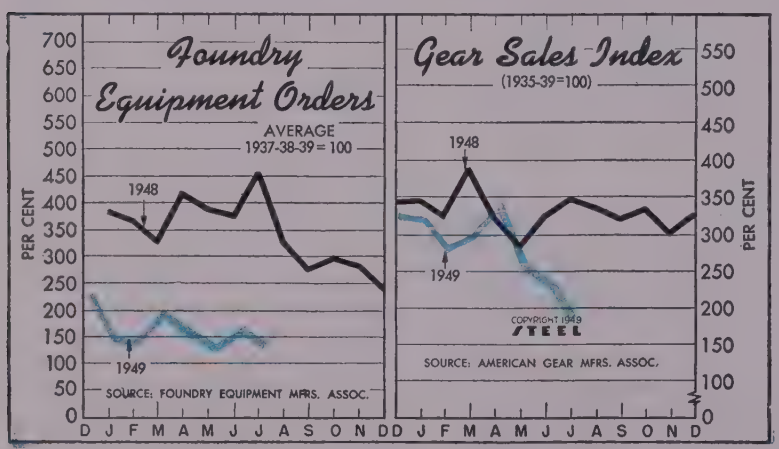


* Week ended Aug. 27 (preliminary).



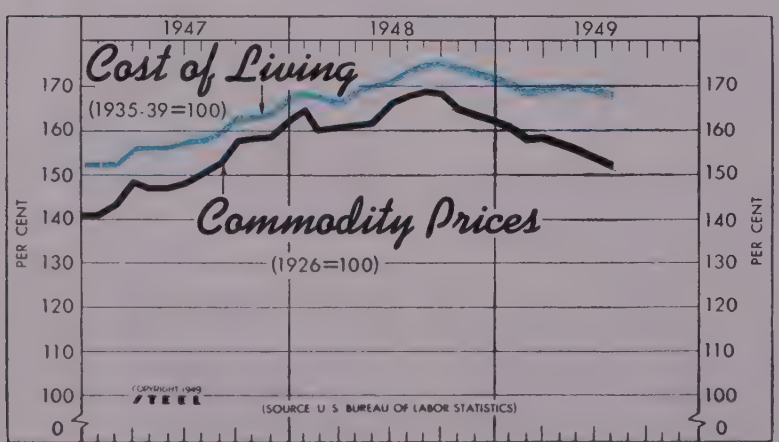
Federal Reserve Board's Production Indexes (1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1949	1948	1949	1948	1949	1948
Jan.	191	193	228	203	184	197
Feb.	189	194	232	203	186	197
Mar.	184	192	233	207	183	200
Apr.	179	188	219	177	168	198
May	174	191	204	206	145	196
June	169	192	177	208	132	194
July	162	186	156	201	130	185
Aug.	...	191	...	207	...	186
Sept.	...	191	...	214	...	191
Oct.	...	195	...	221	...	192
Nov.	...	195	...	223	...	187
Dec.	...	192	...	222	...	185
Ave.	...	192	...	208	...	193



	Foundry Equipment Orders* Index (1937-38-39=100)		Gear Sales Index (1935-39=100)	
	1949	1948	1949	1948
Jan.	149.9	380.9	320.7	346.8
Feb.	144.4	367.3	282.3	324.4
Mar.	190.8	326.2	299.1	389.8
Apr.	172.0	412.0	339.0	320.9
May	121.9	388.5	250.1	283.6
June	164.9	376.8	227.8	324.1
July	146.6	456.3	193.1	348.4
Aug.	....	324.7	....	335.6
Sept.	....	273.5	....	320.4
Oct.	....	296.0	....	333.3
Nov.	....	284.4	....	309.0
Dec.	....	243.7	....	325.9

* By foundry trades only.



Wholesale Commodity Price—Cost of Living Indexes

	Commodities (1926=100)			Living Cost (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.5	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	165.3	156.2
May	155.7	164.2	147.1	169.2	170.5	156.0
June	154.4	166.4	148.0	169.6	171.7	157.1
July	153.4	168.7	150.8	168.5	173.7	158.4
Aug.	....	169.5	153.7	....	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2

The Business Trend

GAINS in the steelmaking rate and in automotive assemblies resulted in advance of STEEL's industrial production index to a preliminary 172 per cent of the 1936—1939 average in the week ended Aug. 27 from 171 a week earlier. This was the first time in nine weeks a current index topped the one for the corresponding week a year ago.

AUTOMOBILES—Outturn of the automotive industry continued to be the bright spot in the industrial picture during the week ended Aug. 27 as 152,312 passenger cars and trucks rolled off assembly lines. Total for the latest week was about 3000 units higher than the preceding week's 149,359. August is certain to go down as the best production month in the industry's history with U. S. operations netting 655,650 units and Canadian plants adding 22,300 vehicles. September operations are scheduled to remain at high levels with the 5 millionth U. S. vehicle of 1949 due for completion during the month, unless a major labor tieup develops.

STEEL—Steelmaking rate made its fifth consecutive advance in the week ended Aug. 27 to 84.5 per cent of capacity. Excluding holiday weeks, the ingot rate dipped to a low of 77 per cent of capacity in mid-July during its decline from peak operations. Since the low point was reached, the advance has been slow but steady and, for the current week at least, is due to continue.

PRICES—Two of the Bureau of Labor Statistics price indicators declined in July. The consumers' price index dipped to 168.5 per cent of the 1935—1939 average on July 15 from 169.6 a month earlier. On July 15, 1948, the index was at the postwar high of 174.5. The bureau's monthly wholesale price index declined 0.6 per cent in July to 153.4 per cent of the 1926 average, 9.1 per cent below the level of one year earlier and 9.7 per cent lower than the August, 1948, postwar peak.

PRODUCTION—Seasonally adjusted index of the Federal Reserve Board declined to 162 per cent of the 1935—1939 average in July from 169 in June. A year ago the index was at 186. Iron and steel index for July was 156, compared with 177 in June and 201 in July, 1948. Nonferrous metals and products index declined 2 points to 130 in July from 132 in June and was well below last July's 185.

BUSINESS—Commercial and industrial failures totaled 719 in July, a decline of 13 per cent from June. Liabilities were $21.8 million for the lowest monthly total since January. Three-fourths of the July failures were postwar businesses.

SALES—Manufacturers' sales in July dropped $1.5 billion from June while inventories declined $500 million during the month, reports the Commerce Department. July sales are estimated at $15 billion but the department adds that a substantial decline during the month is normal because of vacation shutdowns. Sales of durable goods manufacturing firms fell from $7.1 billion in June to $6.3 billion in July, about the same decrease as was recorded a year ago.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	84.5	83.5	81.0	96.0
	Electric Power Distributed (million kilowatt hours)	5,523	5,578	5,518	5,478
	Bituminous Coal Production (daily av.—1000 tons)	1,257	1,333	1,162	2,065
	Petroleum Production (daily av.—1000 bbl)	4,717	4,723	4,677	5,529
	Construction Volume (ENR—Unit $1,000,000)	$147.7	$137.2	$131.8	$95.2
	Automobile and Truck Output (Ward's—number units)	152,312	149,359	138,727	100,699
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	725†	731	724	891
	Business Failures (Dun & Bradstreet, number)	176	193	168	96
	Money in Circulation (in millions of dollars)‡	$27,328	$27,383	$27,333	$27,965
	Department Store Sales (changes from like wk. a yr. ago)‡	−7%	−15%	−10%	+12%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$11,940	$12,640	$12,701	$12,214
	Federal Gross Debt (billions)	$255.3	$254.9	$253.2	$253.2
	Bond Volume, NYSE (millions)	$11.4	$16.1	$13.1	$11.5
	Stocks Sales, NYSE (thousands of shares)	3,662	5,020	4,617	2,858
	Loans and Investments (billions)†	$64.7	$64.2	$63.3	$63.4
	United States Gov't. Obligations Held (millions)†	$36,485	$36,144	$35,507	$34,904
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.55	$91.55	$91.82	$93.86
	STEEL's Nonferrous Metal Composite‡	180.3	180.1	178.3	218.8
	All Commodities†	151.9	151.9	152.8	169.8
	Metals and Metal Products†	167.9	167.9	167.9	172.0
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100.				

Men of Industry

ERIC G. PETERSON

JAMES L. BYROM

H. E. CHILCOAT

Eric G. Peterson has been appointed general manager, Peabody Engineering Corp., New York. He will continue also as general sales manager of all products in all the company's divisions. This broadens Mr. Peterson's supervision to include the activities and welfare of Peabody offices and subsidiaries throughout the world.

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W. J. O'Connell has been appointed district sales manager for Star Tubular Products Co., Chicago, with headquarters in Louisville. He will cover Ohio, West Virginia, Kentucky, Indiana, northern Tennessee, southern Illinois and Missouri. Mr. O'Connell has been sales manager for United Plumbers & Mill Suppliers Inc., Louisville, for the last four years, and previously was affiliated with Crane Co., Cincinnati.

—o—

John L. Neudoerfer has been elected executive vice president, Wheeling Steel Corp., Wheeling, W. Va., and **N. C. Reed** has been elected vice president in charge of sales, succeeding Mr. Neudoerfer. Mr. Reed previously was general manager of sales.

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Grabler Mfg. Co., Cleveland, announces appointment of **Richard A. Blywise** as executive vice president.

—o—

Walter M. Reynolds has been elected secretary, Morse Chain Co., a division of Borg-Warner Corp., Chicago. Mr. Reynolds retains his post as controller of the division, which operates plants in Detroit, Ithaca, N. Y., and England. **R. P. Johnson,** first vice president, assumes the duties of treasurer of Morse Chain Co. The positions of secretary and and treasurer now filled by Messrs. Reynolds and Johnson were formerly combined in one office and held by the late **Stanley B. Waring** of Ithaca. Mr. Reynolds was controller of Hughes Tool Co., Houston, prior to joining Morse Chain Co. He also has been assistant treasurer, Curtiss-Wright Corp., and treasurer and controller of William Sellers & Co.

—o—

James L. Byrom has been elected a vice president of Niles-Bement-Pond Co., West Hartford, Conn. He is manager of the Chandler-Evans Division of the company which manufactures aircraft engine accessories such as carburetors, fuel metering devices, Protek-Plugs, etc.

—o—

George A. Sederberg has been appointed superintendent of the Gary, Ind., plant of Union Drawn Steel Division, Republic Steel Corp., Cleveland. He succeeds the late **Cleo Gustafson.** Mr. Sederberg has been associated with the division since 1922. **Aaron B. Seitz** will assist Mr. Sederberg. He has been plant metallurgist since 1936.

—o—

Chain Belt Co., Milwaukee, has appointed **John C. Toomey** as a district sales engineer in the Detroit district office. He has had 20 years of experience in the selling and applying of materials handling equipment, and has just completed special training in the application of Rex and Baldwin-Rex products at the Milwaukee, Springfield and Worcester, Mass., plants of the company.

—o—

Edgar E. George has been appointed district sales representative, Baker Industrial Truck Division, Baker-Raulang Co., Cleveland. He will maintain headquarters in High Point, N. C. In this capacity Mr. George will serve as materials handling engineer for Baker truck applications and will handle the sale of the equipment. He formerly was with Dura-Products Mfg. Co., Canton, O., where he served as secretary, treasurer and sales manager, and with Mirro-Products Co., High Point, as president. **James H. Rigby** will be associated with Mr. George at High Point. He was with E. I. du Pont de Nemours & Co., Wilmington, Del., and subsequently was with Burlington Mills, Greensboro, N. C., as materials handling co-ordinator.

—o—

H. E. Chilcoat has been appointed manager of the newly created railroad sales department of Townsend Co., New Brighton, Pa. He formerly was vice president in charge of sales for Pressed Steel Car Co., Pittsburgh. His 20-year association with that company was preceded by connections with Westinghouse Air Brake Co. and Clark Car Co. The railroad sales department of Townsend Co. was set up to render special service to Townsend's railroad and car building customers. Headquarters of the new division will be at the company's main office in New Brighton.

—o—

United States Rubber Co., New York, announces appointment of four divisional managers for its wire and cable department to supervise sales of electrical wire and cable throughout the country. **Clarence H. Le Vee** has been named eastern division sales manager, with headquarters in

than the "FASTEST THING IN FASTENINGS"

SPEED NUTS* in continuous strips

Now, assembly costs can be lower and savings higher than ever before. By producing flat-type SPEED NUTS in continuous strip form—Tandem SPEED NUTS—Tinnerman helps solve the critical problem of what to do about production costs.

No longer is the motion of selecting and picking up individual fasteners wasted. The SPEED NUT on the end of the strip is at the tip of the screwdriver at all times—so much easier to handle than an individual nut.

When tightened, a partial shear between each SPEED NUT permits the operator to break the strip away quickly, easily and cleanly—ready to move to the next location. Another saving—there's no loss from SPEED NUTS dropped on the floor.

Ask your nearby Tinnerman representative—he's listed in major city phone directories—or write us for full details on this newest Tinnerman money-saver. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton.

FRANK W. BLANCHETTE

New York; **J. A. Leuver,** appointed western division sales manager, with headquarters in Chicago; **Don B. Karlskind,** named southwestern division sales manager, with headquarters in Dallas; and **L. M. Guibara,** appointed Pacific Coast Division sales manager, with headquarters in Los Angeles.

—o—

Frank W. Blanchette has been appointed representative of Sheffield Corp. and its subsidiary, Murchey Machine & Tool Co., for territory that includes greater New York city and a large portion of New Jersey. He will maintain offices at 965 Broad St., Newark, N. J. Mr. Blanchette spent several years in industrial work and served as chief inspector for Army Ordnance in various plants during the war. More recently he has become widely known as a lecturer before various technical and production groups on quality control subjects in various industrial areas in the eastern part of the United States.

—o—

David H. Goodfellow has been appointed assistant district sales manager, Detroit sales office, for Youngstown Sheet & Tube Co. He served with Follansbee Steel Corp. before joining Youngstown Sheet & Tube as a salesman.

—o—

Cold Metal Products Co., Youngstown, has expanded its New York district sales staff and added to the metropolitan district organization **Joseph G. Wortley** and **Edwin M. Shaw.**

o

J. Kenneth Hull has been elected president of Lockheed Aircraft Service Inc., subsidiary of Lockheed Aircraft Corp., Burbank, Calif. Mr. Hull's post of vice president and general manager, held since 1947 when he transferred from the parent company, is being discontinued. He succeeds **Cyril Chappellet,** now chairman of the board.

—o—

Dr. N. W. Snyder, assistant professor of mechanical engineering at the University of California, has joined the staff of Santa Fe Tank & Tower Co., Los Angeles, as chief technical consultant.

—o—

Westinghouse Electric Corp., Pittsburgh, announces the following appointments: **G. L. MacLane Jr.** has been named manager of the engineering laboratories, succeeding **Thomas L. Spooner,** who retired after 40 years' service with Westinghouse. **James E. Woodall** has been named manager, Fairmont, W. Va., plant of the Lamp Division, and **John Rosevear,** former manager at Fairmont, becomes staff assistant to Mr. Woodall. Two executive appointments in the industry sales departments are: **R. S. Kersh,** named manager of central station sales, and **F. D. Weatherholt,** appointed manager of industrial sales. Both will be located at the East Pittsburgh plant.

—o—

Thomas R. Chadwick has been appointed central division sales manager, Thor Corp., Chicago. He formerly was general sales manager of Cory Corp., Chicago, which he joined in 1938.

—o—

Will L. Corbett has been appointed to a newly created post of assistant to the district manager of American Steel & Wire Co. in Pittsburgh. He was formerly superintendent of industrial relations at the Waukegan, Ill., plant of this company, subsidiary of U. S. Steel Corp., and will serve on special assignment in his new post. **L. F. McGlincy** is district manager of operations in Pittsburgh.

—o—

J. C. Wright, former sales manager of the Newark, N. J., branch of White Motor Co., Cleveland, has been named assistant wholesale manager in Cleveland.

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F. C. Baselt has been appointed assistant director of research, American Can Co., New York.

—o—

Wilfred D. MacDonnell, superintendent of open hearths at the Lackawanna, N. Y., plant of Bethlehem Steel Co., has been appointed assistant general manager of the Johnstown, Pa., plant. **James A. Creighton,** superintendent of No. 1 open-hearth department at Lackawanna, succeeds Mr. MacDonnell, and **Joseph L. Walton,** assistant superintendent, becomes superintendent of No. 1 open hearth.

—o—

J. K. Hamilton has been appointed manager of apparatus research division, Air Reduction Sales Co., New York, with **H. O. Klinke** as assistant manager. **J. T. McKnight** has been appointed superintendent of production and services section, and **T. J. Cholis** became supervisor of patent section.

—o—

W. H. Webb and **Alan Harris** have been appointed specialists on alkali and emulsion cleaning to the consultation service of Detrex Corp., Detroit.

—o—

Horizons Inc., Princeton, N. J., has announced addition to its staff of **Ben W. Fisher,** and **Alfred R. Braun. Peter M. Reif** has been added to its mechanical engineering department.

—o—

I. M. Laddon and **Charles T. Leigh** have been chosen to fill board vacancies at Menasco Mfg. Co., Burbank, Calif. Both are retired aviation executives of San Diego, Calif. Each held the positions of vice president and director of Consolidated Vultee Aircraft Corp., retiring from active administrative service in 1948.

—o—

C. C. Bray has been appointed regional supervisor of the new midwestern district office opened in Chicago by IMO-De Laval Products Division, De Laval Steam Turbine Co., Trenton, N. J. **F. H. Bagley** has been transferred from the De Laval Chicago district office to the new midwestern office, where he will continue to handle the sales and service of De Laval-IMO pumps.

—o—

Llewellyn N. Aller will retire Sept. 30 as secretary and treasurer of Tay-

C. C. BRAY

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Bearing Housing Assembly forgings. Difficult forgings in which thin sections have been successfully retained. The halves are welded together and machined. Each is approximately 13 inches long, 12½ inches wide, 6 inches high. Total unfinished weight 146 lbs.

Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

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STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

lor-Wharton Iron & Steel Co., High Bridge, N. J., where he has served continuously for 56 years.

—o—

Howard Patterson has been appointed superintendent of the agricultural departments at the Midland Works of Crucible Steel Co. of America, Pittsburgh.

—o—

Cleveland Chain & Mfg. Co., Cleveland, has added to its staff **Robert Penovich,** appointed purchasing agent after serving as an assistant in the purchasing department; **Harry E. Figgie Jr.,** analyst in the sales and order department; **Edward C. Maruna,** now working as a draftsman in the engineering department; **Jerrold J. Kelley,** assistant to **Edward Hoge,** plating and galvanizing superintendent; and **Ralph Wallace,** sales assistant. All of the new staff members were recently graduated from colleges.

—o—

Hiram Winternitz Jr., Charles Dreifus Co., Philadelphia, has been appointed a member of the export-import committee, Institute of Scrap Iron & Steel Inc., Washington. He served as a consultant to the Department of State last year at a conference in Paris on the distribution of European scrap.

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A. Lawrence Stewart and **Arthur L. Foltz Jr.** have been assigned as sales representatives to Cleveland and Detroit district offices, respectively, for Allis-Chalmers Mfg. Co., Milwaukee.

—o—

Anderson Stove Co. Inc., Anderson, Ind., has appointed **Ben Oppenhein** vice president in charge of sales.

—o—

Michigan Seamless Tube Co., South Lyon, Mich., announces appointment of **William S. Troy** as its purchasing agent.

—o—

Isaac M. Chambers, assistant general superintendent of the Spring Works, Crucible Steel Co. of America, Pittsburgh, has succeeded **M. V. O'Donnell** as general superintendent. Mr. O'Donnell has retired after 40 years of association with the company.

—o—

Hayden Jones Jr., Norman Phillips and **Earle Young Jr.** have been added to the chemical laboratory staff of the research and development department in Alliance, O., for Babcock & Wilcox Co.

—o—

C. Harry McGill has been appointed manager of purchases and stores, New York, New Haven & Hartford Railroad, New Haven, Conn., succeeding **Charles E. Smith,** who retires as vice president. Mr. McGill will report directly to the president. Mr. Smith will continue as vice president in charge of operation of the County Transportation Co., a New Haven subsidiary.

—o—

Eugene E. Wilson, formerly chairman of the board of United Aircraft Corp., Hartford, Conn., has resigned as chairman of the board of governors of the Aircraft Industries Association, Hartford.

—o—

Raymond P. Lambeck has been promoted to chief product engineer of Hamilton Standard Division, United Aircraft Corp., Hartford, Conn. He will be in charge of engineering requirements of items released for production. Mr. Lambeck was active during the war in co-ordinating Hamilton Standard Division's four licensee plants in this country and Canada. He was appointed chief liaison engineer in 1946.

—o—

Frank L. McLaughlin, purchasing official, and since 1940 executive assistant to the general manager, Pontiac Motor Division, Pontiac, Mich., General Motors Corp., has resigned to operate a Pontiac dealership in Detroit. **Martin F. Rummel** will assume procurement responsibilities at Pontiac, previously carried by Mr. McLaughlin.

—o—

Charles W. Sprenger has been appointed manager of hardware-automotive sales for Carborundum Co., Niagara Falls, N. Y., succeeding **George E. Dresser,** retiring after 42 years' service on the company's sales force. Mr. Sprenger was manager of the New York office, and later assistant manager of hardware-automotive sales. **L. P. Mercer,** formerly manager of the sales training department, has been appointed to succeed Mr. Sprenger as assistant manager.

—o—

Howard P. Gerlach has been appointed vice president of John W. Harris Associates Inc., New York. He will be in charge of the Chicago office.

—o—

Air Reduction Sales Co., New York, announces the following sales personnel changes: **J. B. Davenport,** assistant manager of the Detroit district, has been appointed assistant manager of the Charlotte, N. C., district. **J. H. Hart,** assistant sales manager in Detroit, has been promoted to assistant manager of the district. **R. A. Jamieson** succeeds Mr. Hart in Detroit. **A. S. Blodget Jr.** has been appointed assistant manager of the Boston district.

—o—

David W. Levinson has been named instructor in the department of metallurgical engineering at Illinois Institute of Technology, Chicago.

—o—

John H. Whitney has been elected a member of the board of trustees, National Planning Association, Washington.

—o—

Kenneth P. Bowen has been named assistant vice president of Northrop Aircraft Inc., Hawthorne, Calif. He will be assigned to the office of **B. G. Reed,** vice president in charge of production.

—o—

Clyde L. Hassel has been elected director and president, Pittsburgh Engineering & Machine Co., subsidiary of Pittsburgh Steel Foundry Corp., Pittsburgh. Mr. Hassel has been vice president in charge of sales and engineering of the Pittsburgh Steel Foundry Corp., and will continue in this capacity along with his new duties with the engineering

CHARLES W. SPRENGER

L. P. MERCER

EARL R. HERB

E. J. DUFFY

J. R. WILLIAMS

and machine company. He has been connected with the parent company for over 25 years, serving in production, engineering and sales.

—o—

Earl R. Herb has been appointed district sales manager in North and South Dakota, Minnesota, Wisconsin, Michigan and the northern parts of Indiana and Illinois for Osgood Co. and General Excavator Co., Marion, O. He will make his headquarters in Milwaukee, and will devote his time to supervising sales and service of the Osgood and General power shovels and materials handling equipment, working closely with Osgood-General distributors in that territory. Prior to joining Osgood-General sales force, Mr. Herb spent more than 11 years in the heavy construction equipment field, eight of which were in the field calling upon contractors and allied industries.

—o—

E. J. Duffy has been named assistant general superintendent, Fontana, Calif., plant of Kaiser Steel Corp. He returns to Fontana after 17 months as manager of the Kaiser-Frazer Parts Corp. blast furnace at Provo, Utah.

—o—

Electric Products Co., Cleveland, has appointed **J. R. Williams** as district manager of its Chicago office. He formerly was associated with General Electric Co. in Philadelphia. In his new position Mr. Williams will be responsible for promoting sale of special electrical equipment such as battery chargers, electrolytic equipment, synchronous motors, frequency changers, a-c and d-c generators and industrial dynamometers.

OBITUARIES...

William E. Farrell, 79, founder and chairman of Easton Car & Construction Co., Easton, Pa., died Aug. 23. He was a pioneer in the field of industrial mechanized handling, and an international authority on design and standardization of mine and industrial transportation equipment. Mr. Farrell was president of the company from its founding in 1914 until 1946.

—o—

Emil Gathmann Sr., 76, president, Gathmann Engineering Co. and Gathmann Research Laboratories, both in Catonsville, a suburb of Baltimore, and at one time head of Bethlehem Steel Co.'s ordnance department, Bethlehem, Pa., died recently. He held many patents in the metallurgical field and was a former national chairman of the American Society for Metals, which recently gave an achievement award to him for distinguished contributions to the field.

—o—

James D. McKnight, 42, president of the recently organized warehouse firm, Alloy Steels Inc., Detroit, died Aug. 25 after a short illness. Prior to his association with the new company he had been active in sales for Allegheny Ludlum Steel Corp. for 15 years.

—o—

Arthur V. Crary, 72, vice president, Continental Can Co., New York, before his retirement in 1944, died Aug. 27 after a long illness.

—o—

Wilbur B. Driver, 75, founder of two metal manufacturing concerns, died in Orange, N. J., Aug. 23. In 1900 Mr. Driver founded Driver-Harris Co., Harrison, N. J., and later founded Wilbur B. Driver Co., Newark, N. J., of which he was chairman.

—o—

Charles A. Moore, 69, chairman of the board of Manning, Maxwell & Moore Inc., Muskegon, Mich., died Aug. 23 in Greenwich, Conn. He had been associated for more than 40 years with the metal products firm and served successively as vice president, president and chairman.

—o—

Joseph M. Gilbert, 77, engineering consultant and former vice president, Ludlum Steel Corp., New York, died at his home in Nutley, N. J., Aug. 23.

—o—

J. P. Argyle, 87, who retired in 1946 as vice president, Vierling Steel Works, Chicago, died Aug. 25.

—o—

Earl M. Hayes, 60, general sales manager, Stanley Works, New Britain, Conn., died Aug. 29.

—o—

Charles M. Steinrock, 81, retired executive, C. W. Hunt Iron Mfg. Co., West New Brighton, Staten Island, N. Y., died Aug. 29.

—o—

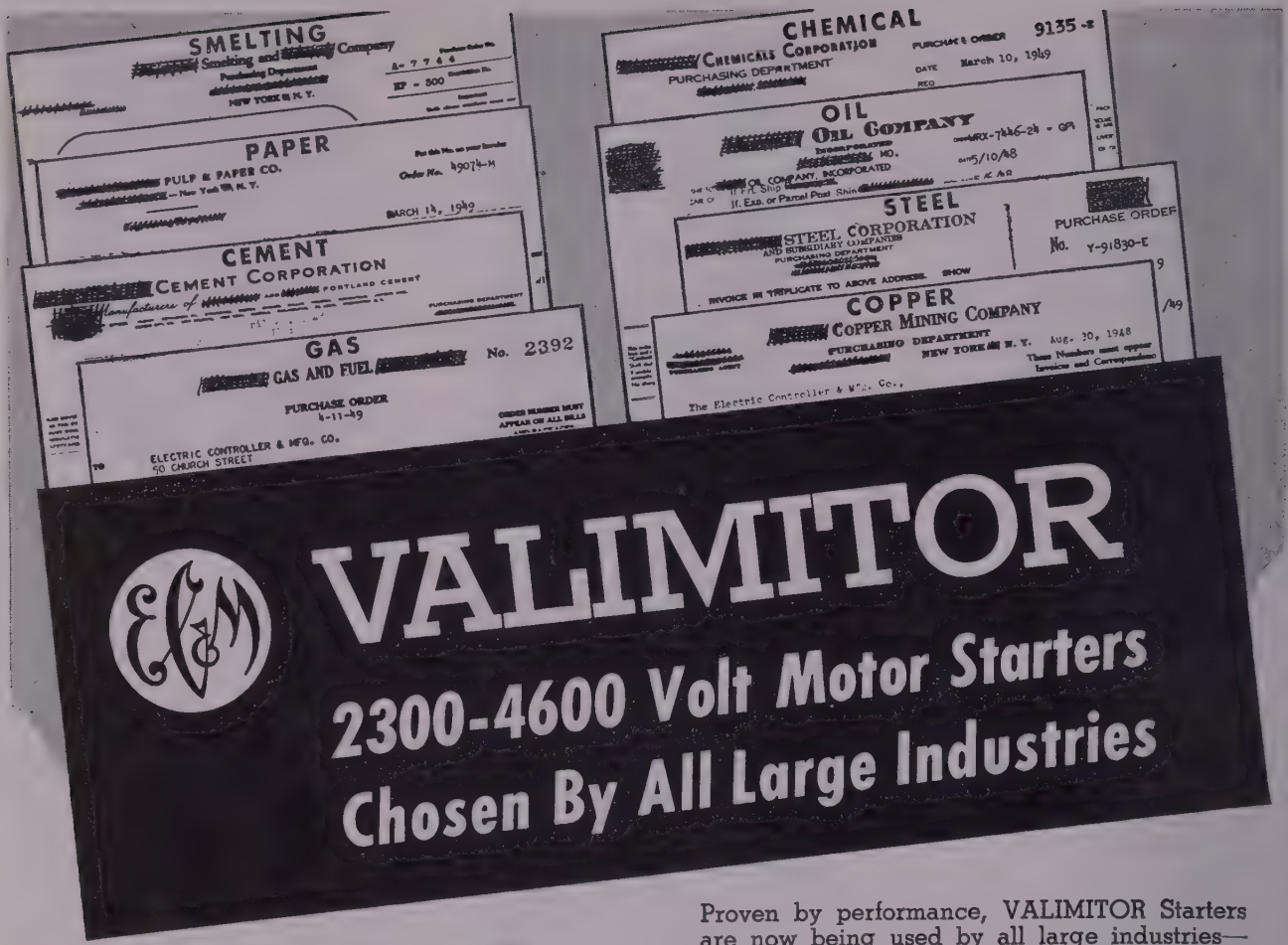
John Marshall, 58, director, Chemical Division, fabric and finishes department, E. I. du Pont de Nemours & Co., Wilmington, Del., died Aug. 27.

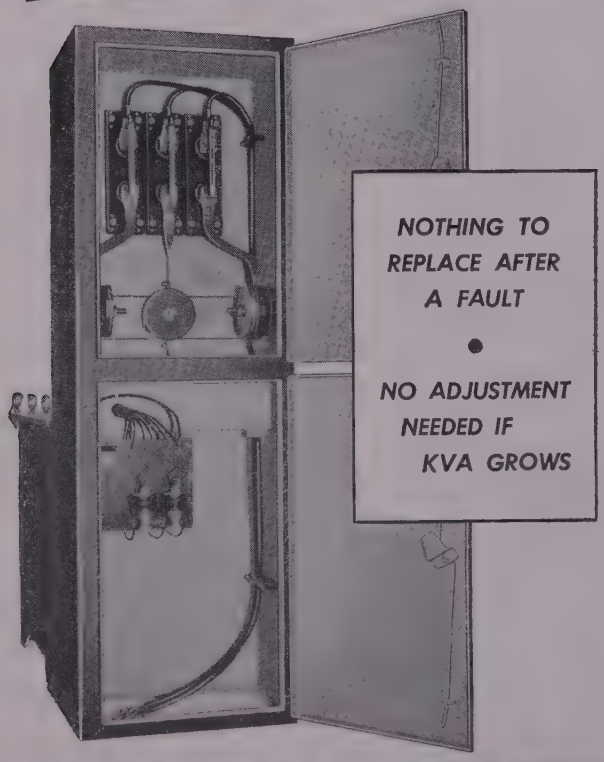
—o—

Howard S. Fraser, 57, sales manager, Swartwout Co., New York, died Aug. 23.

—o—

Fred Albrecht, 65, director, Lodge & Shipley Co., Cincinnati, died Aug. 28. He had been active in the firm since 1906 and was treasurer when he retired three years ago.





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THE ELECTRIC CONTROLLER & MFG. CO.
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Engineering News . . . AT A GLANCE

AIR-CUSHIONED ENGINES—Rubber - cushioned steel shipping shells for protecting jet aircraft engines from damage by jars and jolts are currently being manufactured by Firestone Tire & Rubber Co., Akron, O. Made for Westinghouse J34 jet engines, the airtight steel containers are reported to be pressurized to protect the engine from damaging effects of humid air. They are cradled on rubber air springs designed to absorb practically all shipping shocks by floating the engines on air cushions. Each cylindrical container is made in two sections which encase the engine. After bolting the engine in the container, the unit is sealed, pressurized and mounted on skids with a specially designed rubber air spring suspension system.

"FROZEN HEAT" TECHNIQUE—A secret "frozen heat" process currently employed by Robeson Cutlery Co. Inc., Perry, N. Y., is reported to make knives so superior that they "will outmode and outlive any other type of cutlery on the market." According to the company, stainless steel cutlery made by the new process will require no sharpening for the first 3 years. Steps in the new process include a super-heat treatment, followed by deep freezing. Knife blades are said to be first heated to a temperature below melting point, then quenched in oil, according to the usual process, at a temperature of 140°F. Next they are placed in a specially-constructed deep freeze chamber at extremely sub-zero temperature. After a suitable freezing period, the blades are again heated to relieve stresses and strains, cooled to room temperature and tempered.

TAKES OUT CHAIN "STRETCH"—Hoist load chains employed by Chisholm-Moore Hoist Corp., Tonawanda, N. Y., on its overhead hoists are of a low carbon nickel-molybdenum steel developed some years back by Columbus-McKinnon Chain Corp., an affiliated concern. To enable the chains to operate efficiently on the hoist wheel they must resist both wear and stretching. This is done by subjecting them to two operations—carburizing and heat treatment. The carburizing operation provides the chains with a thin case to resist wear and the heat treatment provides the optimum combination of strength and ductility.

MEASURES COATINGS ON THE SPOT—Thickness of nonmagnetic coatings on carbon steel or iron now can be checked on the spot by an instrument developed recently by Lea Mfg. Co., Waterbury, Conn. Its small size and portability make it especially valuable in plants where components are usually carried to the laboratory for checking. It is capable of measuring coatings from 0.0002-inch with a plus or minus 10 per cent accuracy for thicknesses of 0.001-inch over and a plus or minus 15 per cent accuracy for thicknesses under 0.001-inch.

SOLVES POWER PROBLEMS IN MINIATURE—Machine that duplicates in miniature hundreds of miles of transmission lines in vast electric power networks, and solves in minutes problems ordinarily requiring weeks was recently installed at Schenectady, N. Y., by General Electric Co. engineers. The instrument, which fills a room half the size of a tennis court, includes miles of wire, hundreds of controls, measuring devices and four boards resembling those used by telephone operators. It will help engineers determine what would happen in any part of a network if new lines are added, if a line is broken or if source of power is changed. It also can be used to solve other problems capable of expression in electrical equivalents, such as the study of vibration in machinery or flow of air over an airplane wing.

STILL EXPANDING FIELD—Continuous gas carburizing—a development of comparatively recent years—is now firmly established as an important operation in a wide variety of heat treating plants. Original idea of entering work at one end of a muffle and discharging it at the other end in a carburized condition has been extended to embrace many other operations besides carburizing. Currently, improvements in equipment and broader knowledge of gas behavior are expanding its usefulness (p.78)

MORE ON NODULIZING—Current interest in nodular cast iron was heightened last week by Naval Research Laboratory's announcement of a new iron-silicon-magnesium alloy which exploits lower cost benefits of magnesium and at the same time eliminates processing hazards. The alloy which contains approximately 8 per cent magnesium in a 50 per cent ferrosilicon carrier was evolved in the course of an investigation on the use of magnesium in the deoxidation of cast steel. (p.82)

DIE "SLIPPERINESS"—To obtain a good surface finish when deep drawing stainless steel, a die material is needed that will be highly resistant to abrasion, scoring, or seizing. It must possess natural "slipperiness" so that in combination with the metal to be drawn and lubricant used, desired results are obtained. A new die alloy, a copper-base metal, developed by Ampco Metal Inc., seems to have properties that more than meet above requirements. (p.84)

"KNOT-HOLE" OPERATION—Drawing operation employed to form pipe by the butt-weld process can almost be compared to pulling clay through a knot-hole. Magnetic rolls are used to charge skelp into the furnaces which heat the metal to welding temperatures of 2500° F. Then the ends of the skelp are seized by tongs in the hands of a welder who then drops the handles of the tongs over a bell-shaped die and next on an endless chain which grasps them, pulling the skelp and bell out of the furnace together. The bell is caught and held just outside of the furnace, the skelp being forced through to form a pipe as the edges are welded together. (p.92)

By R. J. COWAN
Metallurgical Consultant
Cleveland

Continuous Ga

In this first section of a two-part article, the author traces the history of a now firmly established heat-treating process which consists essentially of entering work at one end of a muffle and discharging it at the other end in a carburized condition. Vast potentials of the technique can be better appreciated by understanding the factors leading to its present stage of development

CONTINUOUS gas carburizing, which is a development of comparatively recent years, has become firmly established as an important operation in a wide variety of heat treating plants, and is used the world over to produce high quality products. This process is not the work of one man, nor of any single group although spear-headed by Surface Combustion Corp., of Toledo, O., without patenting, and elaborated and amplified by others in various ways.

The original idea of entering the work at one end of a muffle and discharging it at the other end in a carburized condition has been extended to embrace many other operations beside carburizing. Ammonia-bearing gases are mixed with hydrocarbon gases in various ways to produce specific effects in the resulting cases; decomposition products of kerosene oil are used to provide the atmosphere within the muffle; a great variety of diluents modify the carburizing potential of the atmosphere, while at the same time many mechanical improvements have overcome the early handicaps of the apparatus itself and have extended its usefulness to a great many different fields.

In their present state of development these processes are now entering a field of still greater usefulness. To all these, there has now been added the reclaiming of articles that have been slightly decarburized during subsequent processing by a treatment that restores the original carbon content to these areas; and also a method whereby the carbon content of the case may be controlled to provide any desired value. These further extensions of the process will be described in greater detail, in their proper order.

Earliest Carburizing Setup—It is interesting to contrast one of the latest carburizing installations with one of the earliest. In the first, Fig. 1, the work and gases were enclosed within an alloy muffle that extended from one end of the furnace to the other; in the latest a brick muffle is used and the work and gases are heated by radiant tubes suspended within the muffle. The atmosphere-preparation unit shown at the right in Fig. 2 consisted simply of a series of tanks for drying the products of combustion which were generated in a small boxlike structure at the left of the assembly. The control instruments were mounted on the sidewall as shown. The modern atmosphere unit is different, both in appearance and principle. Its appearance will be noted in Fig. 3, and its principle of operation described further along.

The original presentation was made in an article before the Boston meeting of the AIME in 1931, and published as technical paper 439. Before this paper was read a commercial installation had been started at the Newcastle, Ind., plant of Chrysler Motor Corp. The original work had been conducted in a small plant in the laboratories of Surface Combustion Corp., Toledo, O. The study was undertaken as a part of the work on the effects of various atmospheres on metal surfaces, and followed, in point of time, the development of a process for continuous nitriding. In line with this, it was decided to find out what would happen in a continuous furnace when using a hydrocarbon gas for carburizing steel.

The usual thing happened; the furnace muffle filled up with carbon, and the steel came out buried in soot. Experience with other atmospheres in other connections had taught that the alloy of which the muffle was made had an important effect upon the decomposition of gases heated therein, and particularly of hydrocarbon gases. This experience was confirmed by that of others who were concerned with heating these gases without carbon deposition. It had been found that the use of a chrome-iron muffle essentially free of nickel would permit these gases to be heated to carburizing temperatures without clogging the muffle with soot. It must be understood, of course, that the gases were passing through the muffle in a continual stream and not being held therein for long periods of time.

On the other hand, a nickel-containing muffle served to catalyze the breakdown of a hydrocarbon heated therein. In this connection it should be noted that much of the steel intended for carburization contains nickel and accordingly was covered with

Fig. 1—Schematic longitudinal section of early gas carburizing unit. Work and gases were enclosed within an alloy muffle that extended from one end of the furnace to the other

Carburizing

soot even after passing through a chrome-iron muffle. When the alloy muffle was changed in the experimental unit and a chrome-iron muffle installed, there was no longer any objectionable carbon deposition in the muffle, although the steel was covered with soot and the rate of carburizing was well below the usual commercial standards.

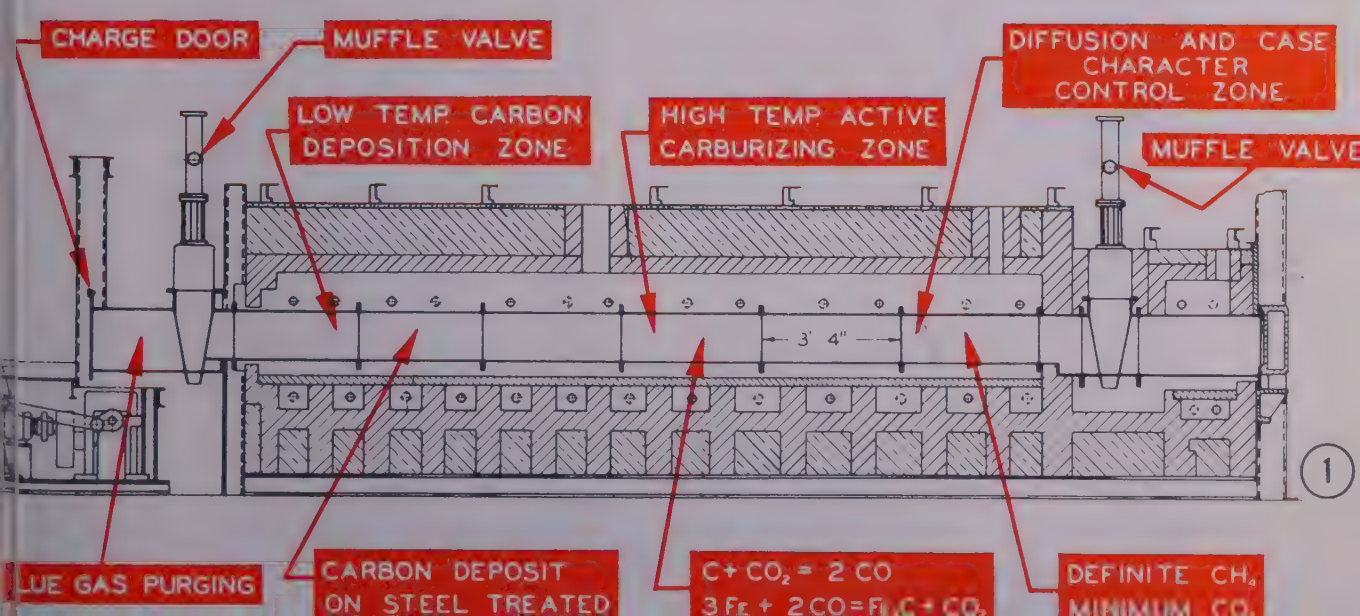
Carburizing With Pure Carbon—A great deal has been written in the literature about carburizing with pure carbon alone. Giolitti, *The Cementation of Iron and Steel* has given an extended historical review of this subject. However, carbon in the form of charcoal is the basis of the well-known "pack carburizing" process. This old historic process had been found at first to be a very slow operation, and in order to improve this the various carbon materials were "energized" by certain alkaline earth carbonates which served to increase the rate very greatly. A part of this increase was due to the liberation of carbon dioxide from these carbonates that had been added to make the "carburizing compound". It was known also, in other connections, that carbon dioxide reacted readily with free carbon at the temperature of carburizing to form carbon monoxide which, of itself, is an effective carburizing agent. Since the steel was coming from the muffle in the pilot furnace well coated with soot, it was decided to add carbon dioxide to the atmosphere of hydrocarbon within the muffle to see what effect this would have on the operation.

In order to supply carbon dioxide in a convenient form that would be suitably diluted, and serve also to lower the concentration of hydrocarbon within the muffle it was decided to use flue gas resulting from the combustion of fuel-gas, which contains some 20 per cent CO_2 and is essentially free from oxygen. To insure this freedom from oxygen the generating furnace was adjusted to produce a so-called "reducing" flue gas containing a little CO. In this way a lot of nitrogen was introduced into the gaseous system, but this did not enter the reactions and served only to dilute the hydrocarbon and reduce the rate of soot formation. By this arrangement two gases were brought into the system with different carburizing characteristics which served to supplement each other in their action each of which possessed strong carburizing potentials.

First Commercial Installation—The first commercial installation was built on these principles and was successful from the beginning. The first pound of work coming from the furnace passed inspection and was placed in service. This installation was placed in a machine shop in line production.

Regarding the alloy, one of the first things encountered was the effect that it had upon the carburizing reactions. In the furnace as constructed, the steel to be carburized was loaded onto alloy trays. These were the so-called 35-15 containing some 35 per cent nickel with 15 per cent chromium. They had been conditioned in the atmosphere before use. The process had been operating smoothly until a new lot of trays were placed in service. A number of these were introduced along with the seasoned trays with the result that there was a gradual reduction of the carburizing rate which soon became serious. A careful investigation revealed no faulty conditions that would account for the difficulty. The only thing that was being done differently was that some new trays were interspersed with the old ones. After several days operation however, at reduced carburizing rates, the difficulty disappeared, but would always reappear when new trays were introduced.

By way of explaining this phenomenon it should



be pointed out that the trays of the usual 35-15 analysis were always strongly magnetic as received, and that after having passed through the muffle a number of times and having been strongly carburized they lost their magnetism progressively. In this condition they would no longer affect the carburizing rate of the steel. This experienec confirmed also the findings of others in other fields so that the fact became well established—a composition of alloy that was magnetic interfered with carburizing, but one that was nonmagnetic did not.

The obvious procedure then, was to specify trays of such a composition as to be nonmagnetic. When this was done however, they were found to be so hard and brittle as to be impractical to use. Accordingly it was decided to return to the use of 35-15 alloy, taking care to introduce only a few at a time in one muffle load. In the course of passing through the muffle repeatedly the trays became highly carburized, and only in this condition were they suitable for use.

"Cauliflowering"—Another difficulty developed in connection with their use which became a serious matter after a time. This was the tendency to "cauliflower" after extended service. The expression "to cauliflower" describes perfectly what happened to some of the trays that had been in service for a long time. They would go through the process time and time again without difficulty and then, suddenly, would seem to blow apart at certain metal intersections, the metal at these points having the appearance of a cauliflower and being completely disintegrated. Sometimes several of these points would develop in the same tray at the same time, and occasionally this disintegration would be so great in a number of trays at the same time as to interfere with the progress of the work through the muffle, since the trays were unable to sustain the load of work on them.

The cause of this phenomenon was soon discovered and was found to be traceable to the presence of "shrinkage cavities" within the casting which had been formed during manufacture. The thing that was happening within the carburizing muffle seemed to be this: Carburizing gases would readily penetrate these shrinkage spots; their breakdown would be catalyzed by the various oxides and inclusions found in such cavities, with the formation of graphitic carbon or soot within this area. In due time the accumulation of carbon within these spots would develop so much pressure within the metal that ultimately the casting would blow apart and form the typical "cauliflower" pattern. So the design of the tray was changed to provide a uniform cross-section and in other ways to produce a more uniform and solid metal throughout.

Several attempts were made at this time to cover the trays in some way, either by means of a metal spray or by plating, in the hope that these shrinkage cavities would be sealed off, and that the effect of the alloy on the carburizing reactions might be removed. None of these proved successful; in fact, some of the plating methods seemed to make matters worse.

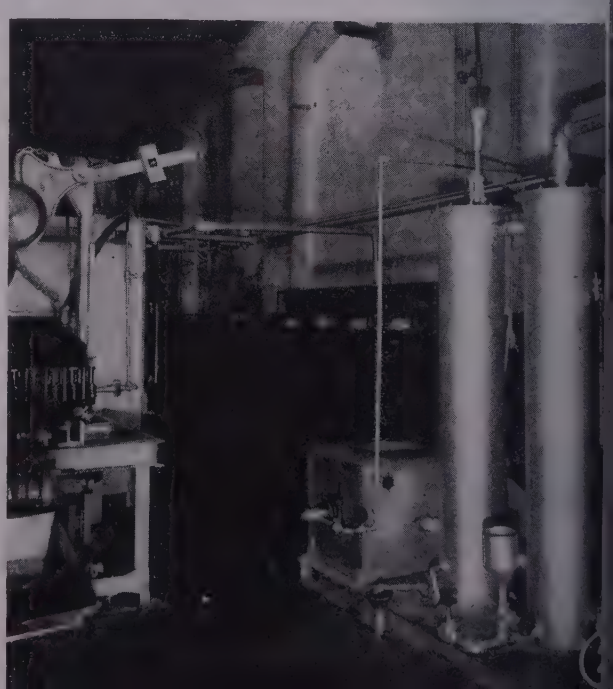
Carburizing Medium—In the first commercial installation natural gas was used as the carburizing medium along with flue gas in about equal proportions. These gases were introduced at the charging end of the muffle and passed along through the muffle with the work, discharging at the opposite end. Suitable chambers were provided at each end for entering and discharging the work. These were purged with flue gas to prevent the entrance of air into the muffle. As the work moved through the muffle it passed through successive zones of carburizing until it reached the desired case depth, when it was discharged. Consequently, the frequency of the push of each successive tray determined the length of time within the furnace and this regulated the depth of case produced. This furnace operated continuously for a number of years.

Along the length of this muffle when in operation several zones were distinguished wherein certain specific chemical reactions took place. At the entrance, and for a distance of approximately one-third of the length, there was the heating zone, followed in order by the carburizing zone at full temperature and the discharge zone. In the heating zone the work was bathed in an atmosphere of hydrocarbon and flue gas at a temperature too low to react with each other appreciably, and where the tendency was somewhat oxidizing to the steel.

This slight oxidization of the surface of the steel catalyzed the breakdown of the hydrocarbon with the formation of soot on the surface of the steel as it entered the carburizing zone proper. To facilitate

Fig. 2—Original DX-unit, consisting of a small combustion chamber at left of assembly, then a cooling tower, water, and a drying tower in which calcium chloride solution was recirculated, followed by a tower containing calcium chloride supported on grids, to complete the drying

Fig. 3—Modern form of DX-unit as used for carburizing. Illustrations courtesy Surface Combustion Corp.



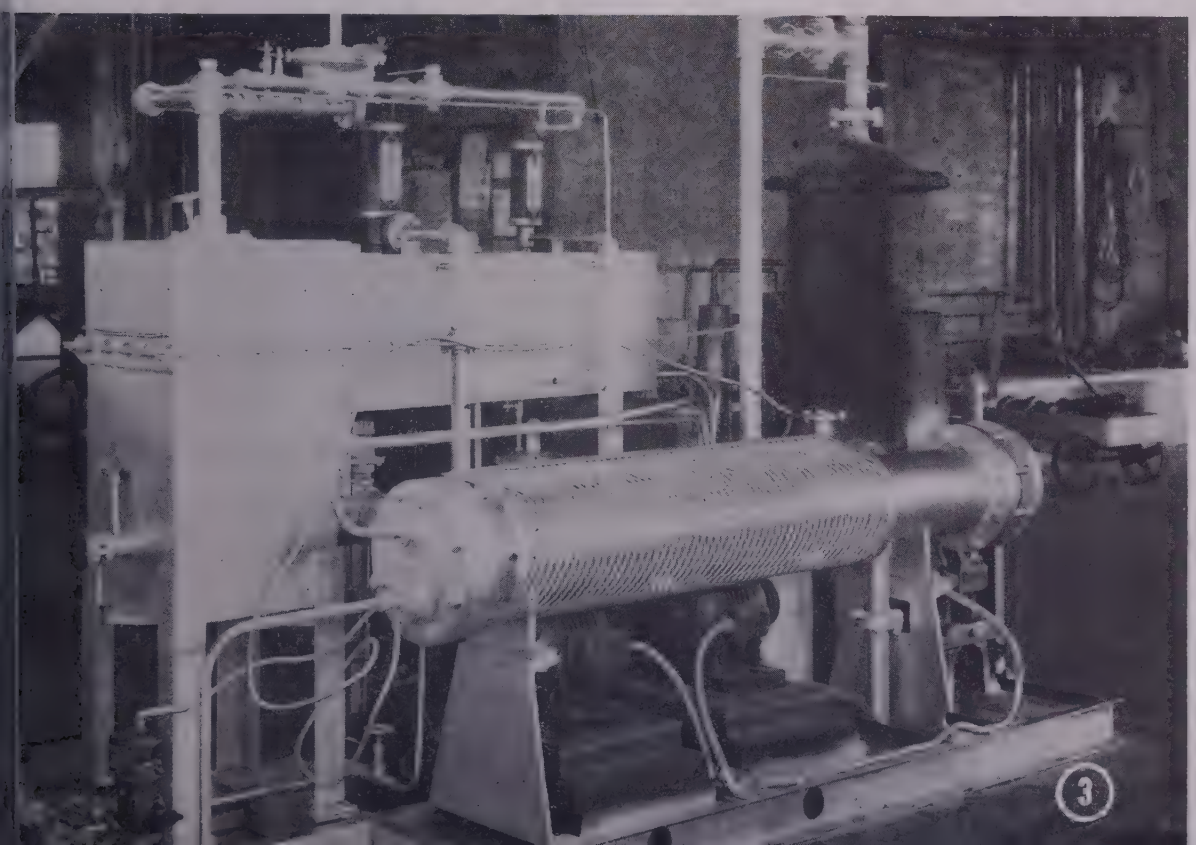
this reaction and concentrate the soot on the surface of the work rather than on the muffle, the muffle in this area was made of chrome iron—20 per cent chromium. This arrangement successfully avoided the deposition of soot on the muffle walls in this area. The soot-covered work entering the carburizing zone at higher temperatures, reacted with carbon dioxide from the flue gas to form carbon monoxide at the work surface which spear-headed the further reactions with hydrocarbon and monoxide to complete the operation farther along.

It is thus apparent that the original idea was to utilize both carbon monoxide and hydrocarbon gas as the carburizing medium, each of these having proved their effectiveness, the one as the principal agent in pack-carburizing, the other in the rotary gas machines. Furthermore, it was known that they produce different characteristics in the resulting case. The hydrocarbon tends to form a highly concentrated carbon case which taken alone would tend to exfoliate, and which consequently requires time for suitable diffusion. Carbon monoxide tends to form a lower carbon concentration which penetrates along the grain boundaries and produces a good bond between case and core thus tending to prevent exfoliation, a well known source of service failure. These two gases supplemented each other, therefore, to form a diffused case during the normal operation without the necessity for subsequent holding at temperature for diffusion. These characteristics were especially marked in the carburizing of carbon steel but became less noticeable as the alloy content of the steel was increased.

Other Chemical Reactions—Further experience in the operation of these continuous gas carburizing units revealed the importance of other chemical reactions that were going on in the low temperature heating zone and which had not been anticipated. These were first noticed and became prominent when the proportion of hydrocarbon in the gas mixture was increased. It was especially prominent and degenerated into a serious problem when the heavier hydrocarbons, propane and butane were substituted for natural gas which had been used in the first installation. This was due to the ease with which these heavier hydrocarbons break down at low temperatures (aided also by the normal catalysis occurring in this zone) to form unsaturated hydrocarbons.

When these unsaturates are heated they react among themselves to form a kind of liquid tar which condenses on the work and tends to collect in depressions such as the root of a gear tooth or other similar area. As this tar rides into the high temperature zone it forms a carbon scale that is tightly adherent and which will ride through with the work and greatly retard carburization. When the work comes from the furnace it will have this scale on it, sometimes almost unnoticeable, and at other times very evident. In appearance it looks like iron scale and is easily mistaken for it, but analysis will show that it is practically pure carbon. Wherever it touches the work the case will be thin and sometimes nonexistent. This is very annoying since it is impossible to predict where this tar will fasten itself on the work. Complete inspection of each part would be required. Obviously, such a situation was unbearable, and a change had to be made.

It should be carefully noted that this condition developed only when using the heavy hydrocarbon gases, propane or butane. It was never a factor in the normal operation with natural gas. As is well known, methane of the natural gas does not break down readily to form unsaturates, and the formation of this tar scale was always traceable to the presence of unsaturates. This was emphasized in the case of one instal- (*Please turn to Page* 127)



Economic and safety advantages seen for

IMPROVED NODULIZING ALLOY

Current interest in nodular cast iron was heightened last week by Naval Research Laboratory's announcement of a new iron-silicon-magnesium alloy which exploits the lower cost benefits of magnesium and at same time eliminates processing hazards

By E. T. MYSKOWSKI and R. P. DUNPHY

Naval Research Laboratory
Navy Department
Washington

CONSIDERABLE attention was focussed recently on the development of nodular cast iron. The work reported by Morrogh and Williams[1] showed a practical but expensive method of producing nodular graphite in low sulphur hypereutectic cast iron by the addition of cerium to the molten metal. A later report by Gagnebin et al[2] indicated that magnesium could also be used to nodulize graphite. While from an economic standpoint the use of magnesium is advantageous, there are certain inherent dangers and undesirable features in the magnesium process as described which made it desirable to develop a safer alloy and process.

The more recent, comprehensive work by Donoho showed that the addition of metallic magnesium per se is recognized as a dangerous procedure because of the explosive reactivity of magnesium with molten cast iron. The recovery of magnesium resulting from direct additions to molten cast iron is reported as being very low. Nickel-magnesium and copper-magnesium alloys containing about 20 per cent magnesium have been used with success in the production of nodular cast iron. But the presence of nickel or copper in increasing amounts in the recirculating scrap poses a serious problem when these elements build up beyond relatively low levels. The use of these alloys also entails a subsequent inoculation treatment with standard graphitizing inoculants in order to develop optimum microstructures and mechanical properties in the iron.[3]

An alloy containing approximately 8 per cent magnesium in a 50 per cent ferrosilicon carrier was evolved at the Naval Research Laboratory in the course of an investigation (*Please turn to Page* 114)

Gray Iron Founders' Society, Cleveland, points out that although conclusions reported by the Navy are based on laboratory tests on synthetic gray iron, and considerable development work involving cupola gray irons of higher sulphur content will be necessary, the new alloy will be of vital interest to all foundrymen for several reasons.

It reports that in iron-silicon-magnesium alloys, unit cost should be low because magnesium is combined with two of the lowest priced and most abundant of metals. It cited Electro Metallurgical Co., which, in experimenting with production of the alloy, estimates final cost as around 15 cents per pound.

Furthermore, alloys of this class will not, in time of emergency or shortages, be difficult to obtain because the carriers, nickel and copper, are not being used to full advantage.

The iron-silicon-magnesium alloys, according to the society should at least potentially be capable of both nodulizing the graphite and inoculating the iron, thereby avoiding the previous necessity for a separate treatment with an inoculating alloy following the nodulizing addition.

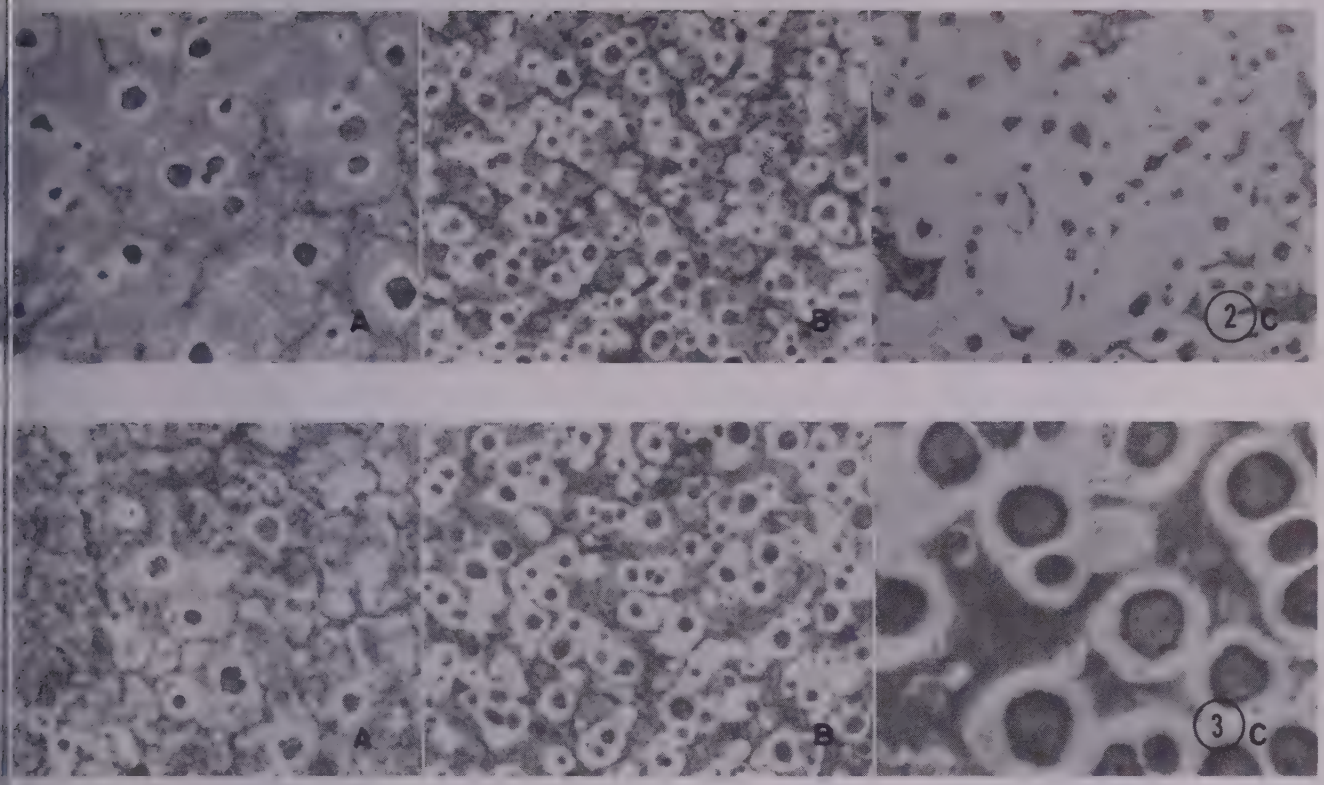


Fig. 1—Effect of magnesium on cast iron (A) Silicon, 2.51 per cent, carbon 3.66, manganese 0.45, sulphur 0.03 (original) 0.029 final, magnesium 0.03 (added) 0.01 (final). (B) Silicon 2.59 per cent, carbon 3.54, manganese 0.44, sulphur 0.03 (original) 0.028 final, magnesium 0.08 (added) 0.05 (final). (C) Silicon 2.52 per cent, carbon 3.31, manganese 0.44, sulphur 0.03 (original) 0.024 (final), magnesium 0.12 (added) 0.11 (final). X100

Fig. 2—Effect of silicon on nodulation of graphite. (A) Silicon 1.61 per cent, carbon 3.51, manganese 0.46, sulphur 0.10 (original) 0.034 (final) magnesium 0.24 (added) 0.09 (final). (B) Silicon 2.29 per cent, carbon 2.68, manganese 0.54, sulphur 0.03 (original) 0.023 (final) magnesium 0.12 (added) 0.07 (final). (C) Silicon 3.89 per cent, carbon 2.47, manganese 0.47, sulphur 0.03 (original) 0.024 (final) magnesium 0.12 (added) 0.09 (final). X100

Fig. 3—Effect of carbon variation on nodular graphite. (A) Silicon 2.83 per cent, carbon 1.97, manganese 0.74, sulphur 0.03 (original) 0.026 (final) magnesium 0.21 (added) 0.15 (final). (B) Silicon 2.82 per cent, carbon 2.71, manganese 0.53, sulphur 0.03 (original) 0.020 (final) magnesium 0.12 (added) 0.07 (final). (C) Silicon 2.52 per cent, carbon 3.31, manganese 0.44, sulphur 0.03 (original) 0.024 (final) magnesium 0.12 (added) 0.11 (final)

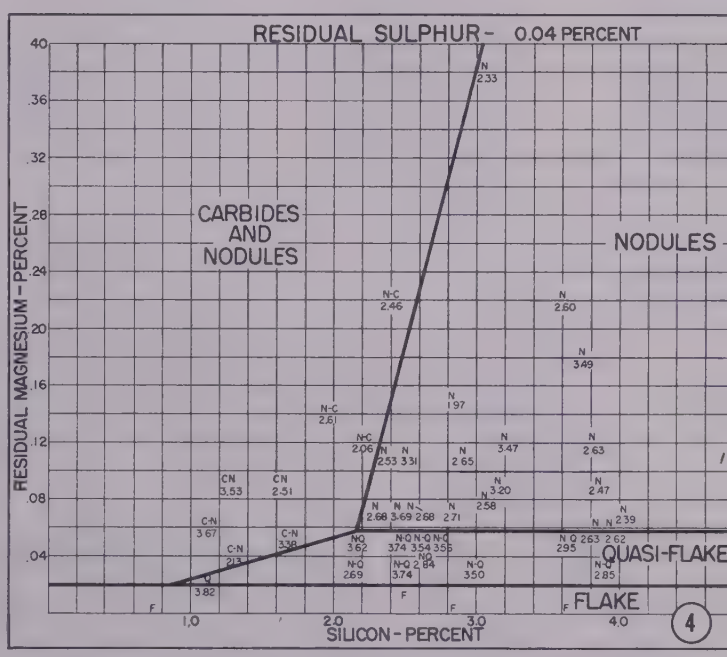


Fig. 4—Mode of occurrence of graphite in induction-melted low-residual sulphur irons (sulphur 0.04 per cent). Carbon contents as noted. X100


NEW
1
2

By J. F. KLEMENT
Chief Metallurgist
Ampco Metal Inc.
Milwaukee

Copper-Base Die Alloys

. . . used economically over wide range of work, affords longer life and freedom from galling, scratching and die maintenance downtime

FROM the myriad of possible combinations of nonferrous elements a new alloy has been developed which has greatly increased ability to withstand plastic deformation, resist galling and scoring and has "slipperiness." Successful applications of this alloy have been made for bending, straight flanging, tube forming, forming contour-flanged parts, deep drawing, roll forming, punch extruding and punch flanging.

In deep drawing stainless steel cooking utensils at one plant, the alloy dies gave lowered costs because of: (1) 100 per cent better die life, (2) 45 per cent lower die maintenance cost, (3) 25 per cent lower belt sanding and polishing costs. In addition to these advantages, the manufacturer obtained more productive press hours by virtue of reduced down time required for die maintenance. Another example is found in the use of the alloy, designated Ampco 24, in forming stainless steel beer barrel parts. On one of the small assemblies, 11-gage stock, which is somewhat heavier than that usually encountered, was required. Results were: Life on the bronze alloy as high as 135,000 pieces without scratching and scoring.

Forming Heads—In forming heads for hot water heaters from 0.145-inch thick low-carbon steel stock, considerable trouble had been experienced in extrusion punch operation. Requirements of the job were to cold extrude a ⅝-inch diameter hole to 3¾-inch diameter in one operation and to hold size as closely as possible. When the punch was made from the new alloy, scoring was eliminated completely and life of the punch was increased to an average of 65,000 pieces.

Choice of a die material for deep drawing is usually based upon past experience and upon the false conception that high hardness (and frequently high cost) is of primary importance. Seldom is serious consideration given to the fundamental properties mentioned above which are desirable in the material, such as resistance to scoring, galling, plastic deformation and low coefficient of friction.

In some cases, the general shape to be formed is of prime importance. In other cases, while shape requirements are significant, the final finish required on the drawn piece is a major factor when determining costs of manufacture. To obtain a good surface finish when deep drawing stainless steel a die material is needed that will be highly resistant to abrasion, scoring and/or seizing. Such a material must possess natural "slipperiness" so that in combination with the metal to be drawn and the lubricant used, the desired results are secured.

Assure Best Results—Hardness alone will not assure the best results obtainable; neither is hardness alone the criterion to be used in determining the life of a die. These other properties mentioned above are more important than die hardness, which, however, is an important factor when correlated with resistance to seizing and scoring.

Dies for forming steels are made from a wide selection of materials ranging from the extremely hard cemented carbides to the very soft materials, even including rubber. It is between these extremes that dies of alloy steels, cast irons, bronze and zinc are used depending upon the specific requirements of the job at hand.

Constituents present in the microstructure of the die alloy are delta, beta and an intermetallic compound. The alloy possesses an ideal microstructure that resists wear but still has excellent antiseizing and antiscoring characteristics. In the photomicrograph, Fig. 2, the metallic structure can be seen at high magnification. Delta constituents are the gray islands which possess hardness of about 450 Brinell

Fig. 1—Statically cast dies

Fig. 2—Photomicrograph showing metallic structure of the new alloy at 800X

Fig. 3—Cast iron die overlayed with bronze

and have a low coefficient of friction which helps give this alloy "slipperiness."

The dark rosette-shaped particles (enlarged here about 800 times) are an intermetallic compound which aids in making the materials more resistant to wear and are so small and evenly distributed throughout the alloy that no scratching or pickup is caused by this particular constituent. Matrix of this die alloy is beta, softer but much tougher than the delta. The beta together with the evenly distributed intermetallic compound gives the material an exceptionally high compressive strength. Tests indicate that the ultimate compressive strength to be well over 260,000 psi while most other alloys of 85 per cent copper content will have a compressive strength of under 150,000 psi.

Low Coefficient of Friction—Another asset of the metal is its low coefficient of friction. Dissimilar metals when used together show a coefficient of friction as low as 75 per cent of that of like metals. Lubrication will overcome high friction but in a die material selections are made to take into consideration metal-to-metal contact. It is for this reason that dissimilar metals are advantageous. The molecular attraction which causes seizure is to a great extent eliminated when a nonferrous alloy is used in conjunction with the ferrous material.

Soundness is an essential feature of good die material. While foundry practice dictates the soundness of materials, it must be admitted that certain alloys, whether ferrous or nonferrous lend themselves more easily to dense structures. Microshrinkage common to tin bronzes is not found in this special bronze alloy. Fine grain structure is achieved and controlled by special additions of iron, nickel and other grain refiners.

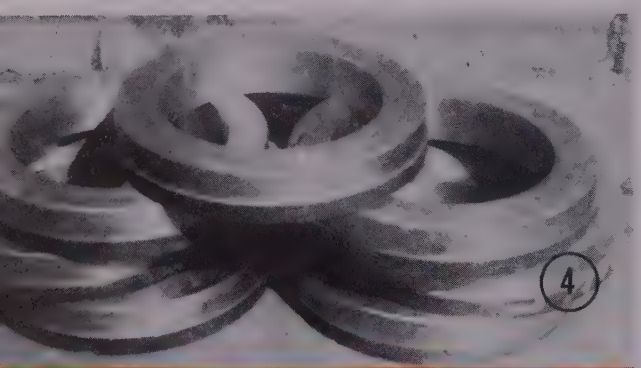
Another beneficial property of a nonferrous alloy for a die material is its ability to withstand corrosion and oxidation. Although lubricant and surrounding atmospheres are not generally deleterious to the surface of dies, conditions do exist that make it desirable to have a die material that will resist deterioration from surrounding atmospheres and elements.

Methods of Producing Dies—The alloy can be cast roughly to shape. It can be forged, but due to its critical cooling rates, more harm than good is often done. The desired metallurgical structure as shown in Fig. 2 can be obtained by controlling both static and centrifugal casting methods.

Where shapes other than rounds or oval are to be drawn, the static method of producing these dies is used. Naturally the smaller and simpler the die design, the easier it is to cast. However, large, somewhat complicated dies are obtainable by careful foundry practice. In Fig. 1 a few statically cast dies are shown. The dies (lower right) weigh about 300 pounds each and will eventually be used for drawing steel trays that must be perfect both in surface and dimension because of further processing. The upper left die weighing about 1200 pounds is to be used in draw refrigerator doors.

Fortunately, a fairly large number of products are round or elliptical and the centrifugal process of casting can be used for the production of these dies. The advantage of centrifugal casting lies mainly in its denser structure due to controlled directional solidification. Fig. 4 shows a few round centrifugal dies used by manufacturers of stainless steel kitchen utensils. Here a smooth scratch-free surface is needed to eliminate excess cleaning and polishing costs.

Still another method of utilizing bronze as a die material is to overlay the working surfaces of a steel or cast iron die body using an aluminum bronze electrode. Although this method is not generally used, it has proved successful and should be considered when the die is designed. Both regular and alloy cast iron dies that have not been entirely satisfactory have been salvaged by using a bronze overlay. Both the metallic and carbon arc methods have been used for overlaying such dies. Fig. 3 shows a cast iron die overlayed with bronze. This die has been used for thousands of stainless (*Please turn to Page* 124)



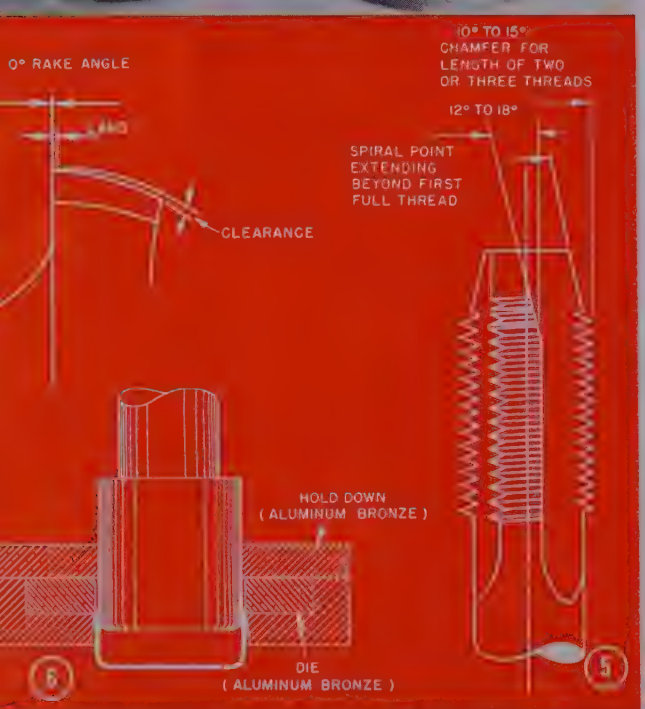


Fig. 4—Round cylindrical dies used by manufacturers of stainless steel kitchen utensils

Fig. 5—Tap should be of the design shown here, using a standard or slightly oversize drill for the desired thread

Fig. 6—Typical deep drawing setup for both hold-down and draw ring

Pimpling of Aluminum Die Castings

A phenomenon that occurs in aluminum die castings, pimpling is a problem not universally understood. Two conditions of cause are discussed as well as methods of eliminating them. Alloy composition is reported to have no effect if casting temperature is below alloy melting point

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REASONS for pimpling of aluminum die castings are not universally understood by those concerned with the problem. Largely, the phenomenon is related to the amount of mechanically trapped and compressed gas (mainly air) that is occluded in the pressure casting.

When a die casting is exposed to temperatures approaching the solidus (the temperature at which the alloy begins to melt), the very soft material cannot resist the increased pressure of the heated trapped air; pimpling and distortion result. Typical die cast aluminum alloys heated in the range of 900 to 980° F are so soft at these temperatures that their strengths are practically zero. Trapped air compressed at the time the casting shot was made finds little resistance to its increased pressure and a pimple forms.

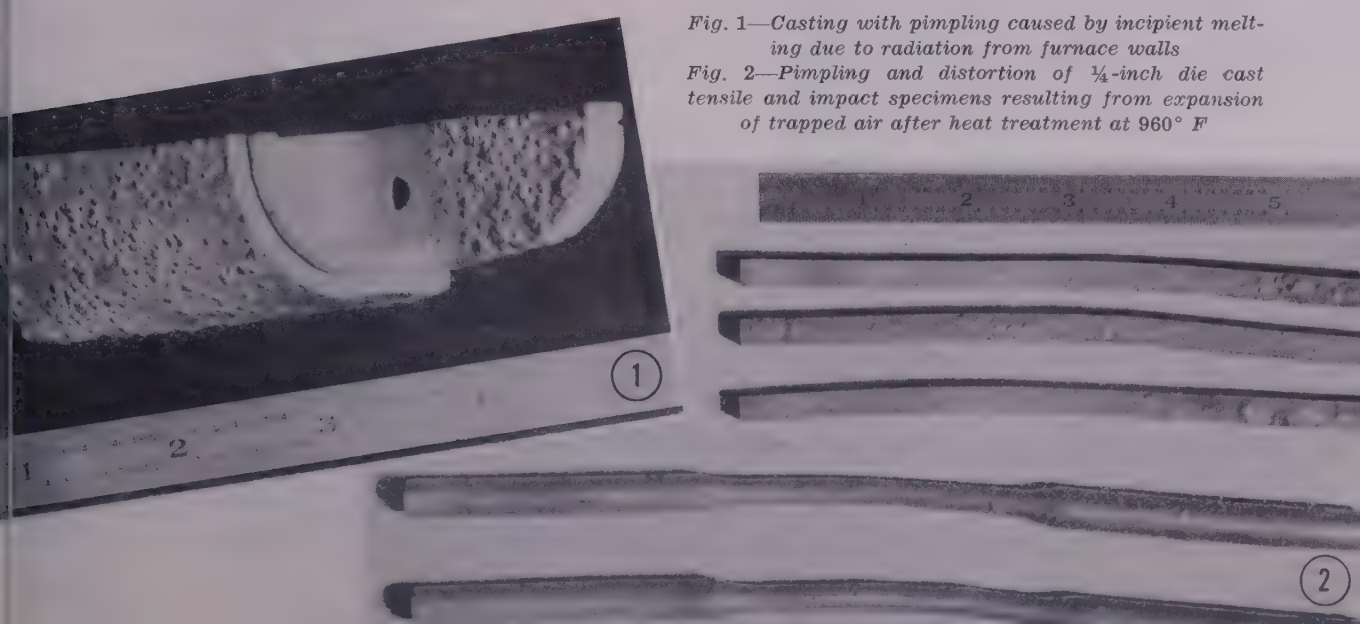
A second type of pimpling, caused by a completely unrelated phenomenon, occurs when melting begins, due to a volume change as the metal of eutectic composition changes from solid to liquid.

Alloy composition has no effect on pimpling, providing the temperature to which the castings are exposed is lower than the solidus of the alloy. Under these conditions the eutectic is not melted and substantial volume change cannot occur.

Case in Theory—For instance, consider the hypothetical case of two air-free die castings. Let us assume one was produced from pure aluminum to which 4 per cent copper and 8 per cent silicon was added. This would be an alloy satisfying the requirements of ASTM die casting alloy SC7. The second casting was also produced from pure aluminum, to which was added 11.6 per cent silicon. This would be equivalent to ASTM die casting alloy S9.

If it were decided to test these air-free die castings at 1020° F, the alloy with copper and silicon would pimple while the eutectic aluminum-silicon alloy would not. The reason for this is related to the low solidus temperature of the SC7 alloy (about 970° F). It is to be noted that the testing temperature is above the solidus for this alloy and the casting would begin to melt at the grain boundaries. The large thermal expansion (about 5 per cent by volume) in the change from solid to liquid causes sweating or pimpling. This alloy freezes over a temperature range; it starts to freeze at about 1100° F and is completely solid at 970° F. Obviously any heat treatments must be

Fig. 1—Casting with pimpling caused by incipient melting due to radiation from furnace walls
Fig. 2—Pimpling and distortion of ¼-inch die cast tensile and impact specimens resulting from expansion of trapped air after heat treatment at 960° F



conducted under this latter solidus temperature of 970° F.

The 11.6 per cent silicon alloy, on the other hand, has no freezing range under ideal equilibrium conditions and the liquidus is the same as the solidus (1070° F). This alloy has a true melting point. Hence it could be heated at any temperature under 1070° F, such as 1020° F in the above example, without incipient melting and its attendant sweating and pimpling.

An example of this type of pimpling is shown in Fig. 1. This casting, not a die casting, was used to show that this phenomenon is independent of the casting process used. It was exposed to the radiant heat from the walls of a furnace. The surfaces thus exposed were heated slightly over the solidus, causing partial melting. The sweated material formed the pimples shown. Note that the surfaces protected from the radiation are not so pimpled. The temperature of the *atmosphere* in the furnace was therefore below the solidus.

Not Related to Composition — Since commercial variations in the percentages of alloying elements in a specific alloy have little effect on the solidus or liquidus, pimpling, as this article is considering it, is *not* related to alloy composition.

Designers of die castings and their producers have long been acquainted with the "skin strength" of die castings. They know that the as-cast surfaces are strong and sound but the interior is likely to be spongy from shrinkage and mechanically trapped air. With the old gooseneck hot-chamber type of machine these defects were usually visible to the naked eye and could be readily observed in a fracture.

With the advent of the high-pressure cold-chamber aluminum die-casting machine, shrinkage was reduced and the trapped air was so finely dispersed and so greatly compressed as to defy simple detection. Even x-ray examination might not reveal the condition; but this is understandable since the dispersed compressed air voids might be smaller than the 2 to 3 per cent sensitivity common to good radiographic technique.

If these castings are heated to within 20 to 50° F of the solidus, air trapped in these "sound" die castings begins to manifest itself as pimples. The unequal expansion of the heated casting due to segregation of the trapped air results in distortion.

Pimpling After Soaking—A typical example of this situation is seen in Fig. 2. These die cast test specimens were "sound" to the eye and had superior mechanical properties but the trapped air they contained became obvious upon heating to 960° F. These same castings had shown no sign of pimpling or distortion after extended heating at 700° F, but they had revealed a slight tendency to pimple after prolonged soaking at 800° F. All these temperatures are well below the solidus, hence the pimpling is not related to any incipient melting, nor to alloy composition.

This entire problem, of course, is obviated if die castings do not contain mechanically trapped air. This desirable situation can be realized if certain conditions relating to gating and venting techniques are fulfilled.*

Die casting producers are occasionally required to submit samples of certain castings for pimpling tests. Electric iron sole plates, some cookware, and home gas range burners are typical examples. Sand and permanent mold castings are never so tested because in these pimpling cannot occur until melting begins.

No Air Under Pressure—Compressed air bubbles are not normally found in castings produced by these processes. True, sand and permanent mold castings can be, and often are, porous, but such porosity can never cause pimpling because the gas that caused the initial porosity cannot attain the pressure it originally had until the casting is heated to solidus temperatures and melting begins.

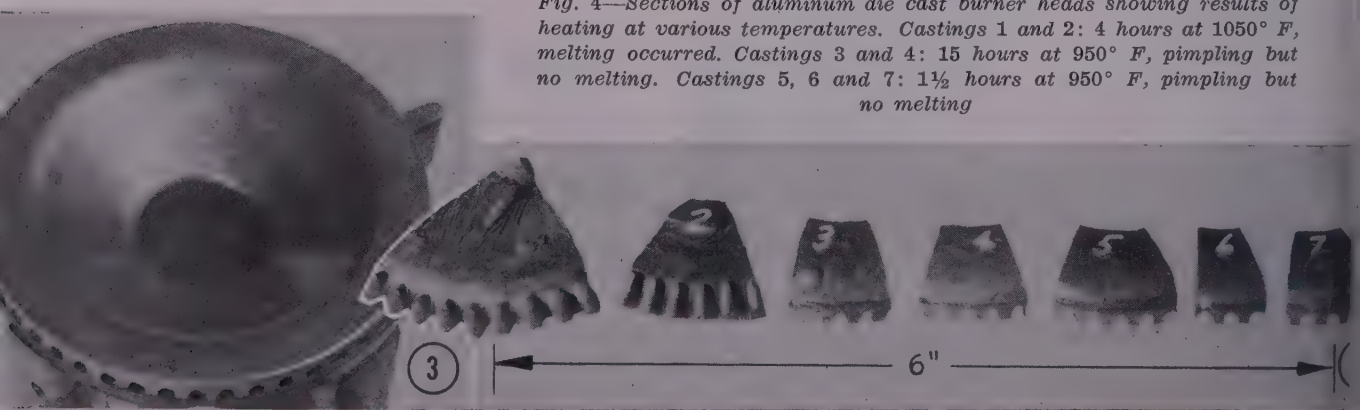
Where intelligent pimpling tests are devised for die castings, such tests actually check the die casting technique used in the production of castings. If the maximum operating temperature is known, this temperature should be used. If this maximum temperature is above the solidus of aluminum alloys, obviously it cannot be used.

For the typical electric iron sole plate, therefore, 600° F represents about the maximum temperature that could be experienced. Hence it is pointless to test the die casting for pimpling at temperatures over 600 or 650° F. One or 2 hours will usually produce all the pimpling that will occur.

Fig. 3 shows a typical (*Please turn to Page* 120)

* "Heat Treatment of Aluminum Alloy Die Castings", R. A. Quadt: Die Castings, February and March, 1948.

Fig. 3—Typical aluminum die cast burner heat used on a home gas range
Fig. 4—Sections of aluminum die cast burner heads showing results of heating at various temperatures. Castings 1 and 2: 4 hours at 1050° F, melting occurred. Castings 3 and 4: 15 hours at 950° F, pimpling but no melting. Castings 5, 6 and 7: 1½ hours at 950° F, pimpling but no melting



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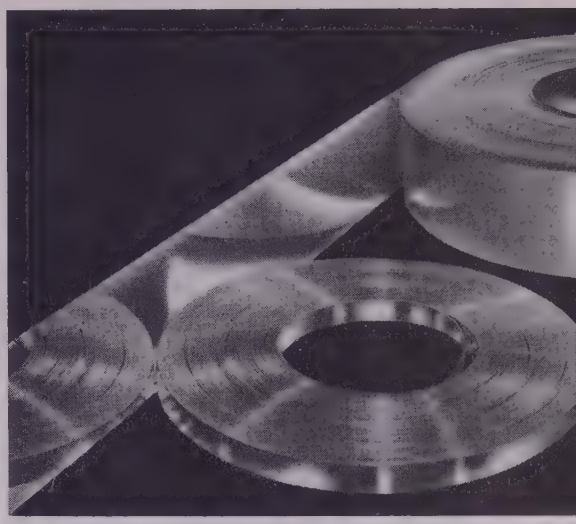

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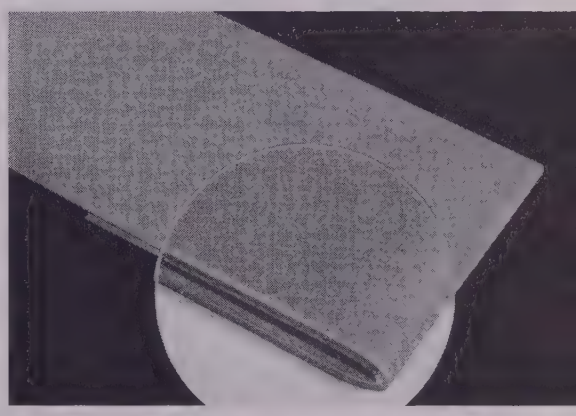

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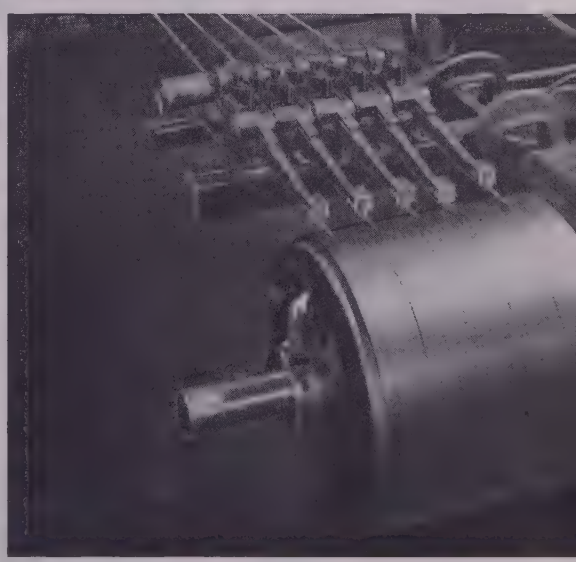

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NUMBER 12 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production of BUTT AND LAP WELDED PIPE CONDUIT and Electric Metallic Tubing

The author traces the development of pipemaking from its inception 5000 years ago up to the present day processes of manufacture. All types with the exception of seamless tubes are discussed in detail

By H. E. ENGELBAUGH
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Fig. 1—In Carthage, about 300 B.C., a series of reservoirs fed by an aquaduct over 50 miles long was constructed

PIPE has played a major role in the advancement of civilization throughout the ages. Prehistoric man learned the convenience of utilizing crudely dug trenches for his water supply. Through the years greater intelligence led to the use of a fallen hollow log to convey water—the first water pipe.

The oldest record of pipe, as we know it today, is a twin line of clay pipes found at Nippur in Babylon which over 5000 years ago was a flourishing metropolis. Copper pipe, over 5000 years old, was found within the temple at Abusir, near the Pyramids of Egypt. This pipe runs from the upper temple, along the connecting masonry causeway, to the outer temple on the river.

Reservoirs in the hills of Judah and aqueducts built in the reign of King Solomon (1018-978 B. C.) are considered to be as important as any technical achievement of antiquity. In Julius Caesar's time, aqueducts over 50 miles in length supplied water to every worthwhile residence in the city of Carthage. These ducts ran from the distant mountains to the cisterns in the town. When the Greeks conquered Crete, they discovered that at Cnossus, complete water supply, drainage, and sewage systems were installed. Consequently, soon afterwards the cities of Greece began to be influenced by these borrowed advancements. In ancient Syracuse, the aqueduct built for Polycrates (535-522 B. C.) is still in use.

The Romans were the first to adopt lead pipe, which was formed by bending lead plates around a wooden cylinder and soldering the V-shaped trough at the top. Many pipe fittings have been found in the ruins of ancient Roman mansions which are surprisingly similar to those in use today. Four-branch fittings, brass stopcocks, and wiped joints are numbered among such articles.

After a thousand years of world rule, the Roman empire gradually crumbled and with this the strict sanitary measures that they established were abolished. This led to the filth and pestilence of the Dark Ages when one-fourth of the population of Europe was destroyed by the "black death."

No further advancements took place until the Middle Ages when the cities that sprang up in Europe turned their attention more to distribution systems and extended the use of networks of mains much as we use today. Pipes of clay, wood and lead were used at that time.

In 1583, a waterwheel powered pumping plant was built at London Bridge. However, the hundreds of miles of wooden mains that were in use could not withstand the pressure required to force water to the upper stories of many houses and this system proved to be very troublesome. In the year 1664, an experiment was made using cast iron pipe for lines in Versailles, France. Joints of this pipe were of the bolted type with lead gaskets; trouble was experienced through the rusting of the bolts. This difficulty was largely overcome in 1785 by the invention of the bell and spigot joint by Thomas Simpson in London.[1]

In 1792, a Scottish inventor, William Murdock, in-

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He entered the employ of Youngstown Sheet and Tube Co. in 1925, his first assignment being in the labor department. In a short time, he was transferred to the inspection department and, in 1927, was promoted to inspection foreman. In 1931, he was named assistant chief inspector and, in 1937, became superintendent of the seamless tube mills. Four years later, he became superintendent of all tube mills at Campbell works and, in 1943, was appointed assistant general superintendent. On January 1, 1947, he was appointed manager of the Youngstown district.

troduced in London a new system of lighting with coal gas. In casting about for a method of conducting the gas from the generator to the points of use, he discovered an over-supply of old gun barrels that offered a solution to his problems. By threading the ends of the barrels, he was able to join them together into a continuous pipe line. His system of lighting proved so popular that it created an immediate demand for iron tubing and stimulated a search by other inventors to find cheaper and faster ways of producing tubes. In 1824, James Russell filed a patent on "an improvement in the manufacture of tubes for gas and other purposes." This was the beginning of butt weld pipe. The process consisted essentially of bending the plate to cylindrical form and butting together the white hot edges and forging the joint with a tilt hammer having a grooved face to fit the shape of the pipe. The rough tube was then reheated and

Fig. 2—Method of forming pipe in Roman times was by bending lead plates around a wooden cylinder and then soldering the V-shaped trough at the top

Electric Metallic Tubing

passed through a rolling mill over a mandrel. The next year, however, Russell's work was overshadowed by the invention of Cornelius Whitehouse, who succeeded in forming a commercially perfect tube by merely drawing the flat plate, heated to the proper temperature, through a "bell" or die.[2]

The first patent, covering machinery and apparatus for carrying out the lap weld process of making tubes, was granted in 1812 to Osborne, an Englishman. Prior to this time, tubes were made by hand from plates which were first bent into cylindrical form, then the edges were overlapped, heated and welded together over a mandrel.

The manufacture of butt weld pipe has been essentially the same ever since Whitehouse's invention, in that the forming and welding was accomplished by drawing skelp through a die. Of course, there have been many changes in the process of charging, heating, drawing, etc.

Development of the first continuous butt-weld pipe mill was started in the year 1911 by John Moon. Later, with S. S. Fretz Jr., he undertook the first experiments on continuous butt weld pipe and the first patents were issued in 1923. It was called the Fretz-Moon pipe process. This type of pipe mill uses rolls instead of a bell in forming and welding pipe.[3]

Following paragraphs give a brief description of the lap weld, old type butt weld and the new continuous butt weld processes.

In making lap weld pipe, skelp is first rolled to the necessary length, width and gage for the size to be made, and the subsequent process consists of two operations—bending or drawing, and welding. The skelp is first heated to a cherry red in the bending furnace and then put through a pair of scarfing rolls which bevel the edges so that when overlapped and welded the seam will be neat and smooth, with practically the same thickness as the remainder of the pipe wall. After this is done, the skelp is drawn through a bending die, where it is given roughly the cylindrical shape of a pipe with the edges overlapping, but not welded. This formed skelp is then rolled into a motor-driven buggy and conveyed to another furnace called the welding furnace, where it is recharged and heated evenly to a welding temperature of about 2500° F. Next, it is pushed into welding rolls located at an opening in front of the furnace, which draw it through and complete the welding operation.

These rolls are two in number, and have semicircular surfaces which, together, form a complete circle. Between these rolls a cast ball or mandrel of approximately the same diameter as the internal diameter of the pipe to be made, and shaped somewhat like a projectile, is held by a strong bar while the pipe passes over it and between the rolls. This subjects the lapped edges to a pressure between the rolls and the mandrel and welds them firmly together, at the same time reducing the thickness of the lap to that of the remaining wall of the pipe. The welded pipe is then carefully inspected for any

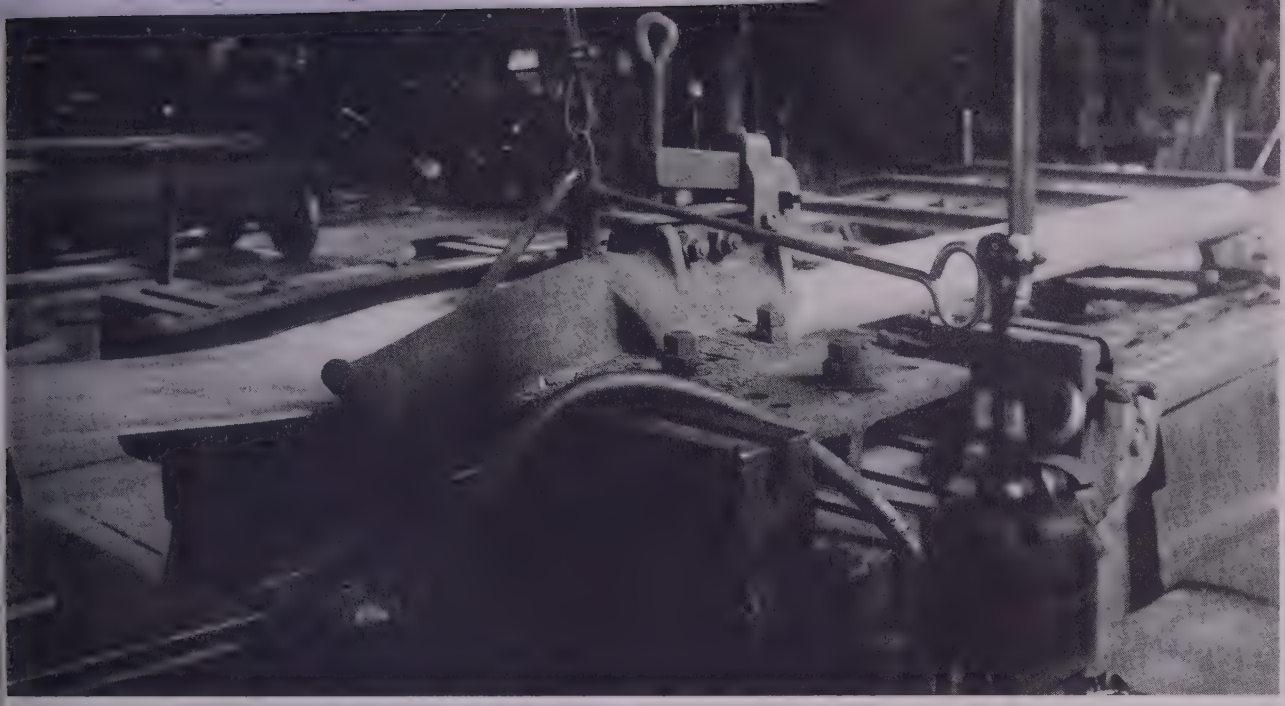


Fig. 3—Bending die, showing how skelp is bent into a cylindrical shape

Electric Metallic Tubing

flaw that may have occurred in the process.

The pipe, while still hot, is then put through a similar set of rolls called "chilled rolls," and a mandrel held in the same position as in the welding rolls. This removes any inside irregularities and provides the accuracy in the internal diameter. Next it is put through another set of similar rolls, called "size-rolls," without the mandrel, which give an equal pressure on the whole circumference, thereby securing accuracy in the outside diameter.

The pipe then enters a set of rolls, called "cross-rolls," which consist of two rolls set with their axes askew. Length of these rolls varies from 4 to 16 feet and, after passing through them, the pipe is approximately straight and uniform at all points. The surface of these rolls is so curved that the pipe is in contact with each roll practically its full length; this gives a clean surface and renders the pipe straight.

After this process, pipe lengths are slowly rolled up an inclined cooling rack and allowed to cool off slowly and uniformly, the constant turning keeping it straight during this process. At the end of this rack the pipe is put through a straightening machine, after which it is again inspected and then passed on to the finishing department.

The pipe is next delivered to cutoff and threading machines where crop ends are cut off, wall thickness checked, and the pipe threaded. The crop ends of the pipe are crushed and wall thickness checked in accordance with specifications of the American Petroleum Institute and American Iron and Steel Institute.

Threaded pipe is furnished with various threads being distinguished from one another by the number of threads per inch, taper per inch, and other differences, depending on the class of material and the purpose for which it is to be used.

After the pipe has been threaded, it is again carefully inspected to detect bad threads. Couplings are next put on by hand, being turned on the proper distance in this way, and then screwed up to the allowance by machines called "socket screwing machines." Both pipe and couplings are then again inspected for any defects possibly overlooked in previous inspections, and after this final examination they are sent to the hydrostatic tester. Here both the pipe and coupling are given the final test by being subjected, for 5

Fig. 4—Discharge end of welding furnace, showing pipe passing through lap welding rolls over mandrel

seconds, to an internal hydrostatic pressure. Any bad welds or defects in the pipe will show up immediately under the pressure used.

After the hydrostatic test, it is stenciled as designated by specification and is ready for shipment. The process for galvanized lap weld pipe is identical except that, after the cutoff machines, the pipe is transferred to the galvanizing department to processing, and returned to finishing floor for threading.

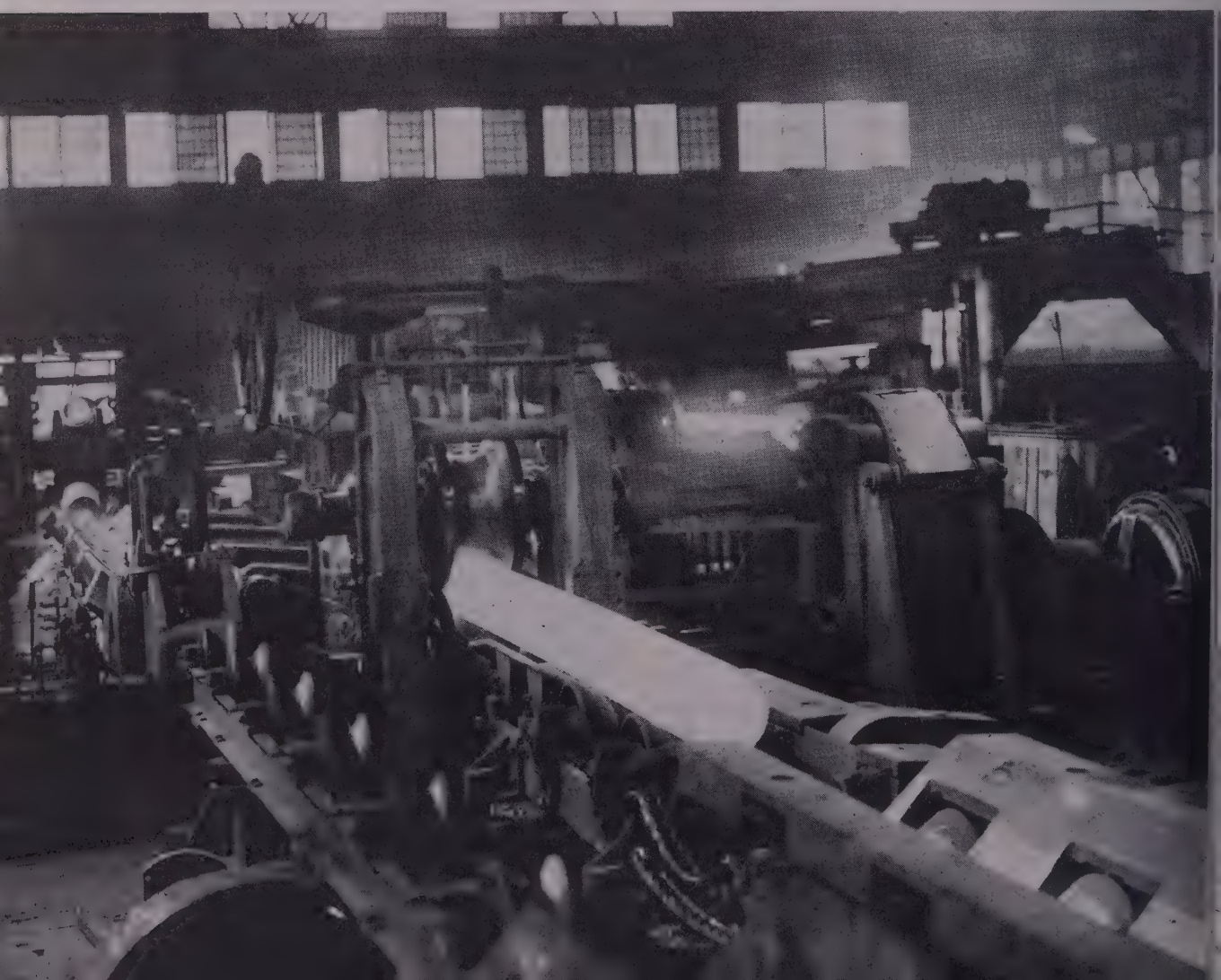
Butt weld pipe is made in sizes of ⅛ to 3 inches inclusive, the skelp ranging in width from 1 2/10 to 11¾ inches. It is essential that skelp for butt weld pipe be rolled true to length, width and gage for the size of pipe to be made.

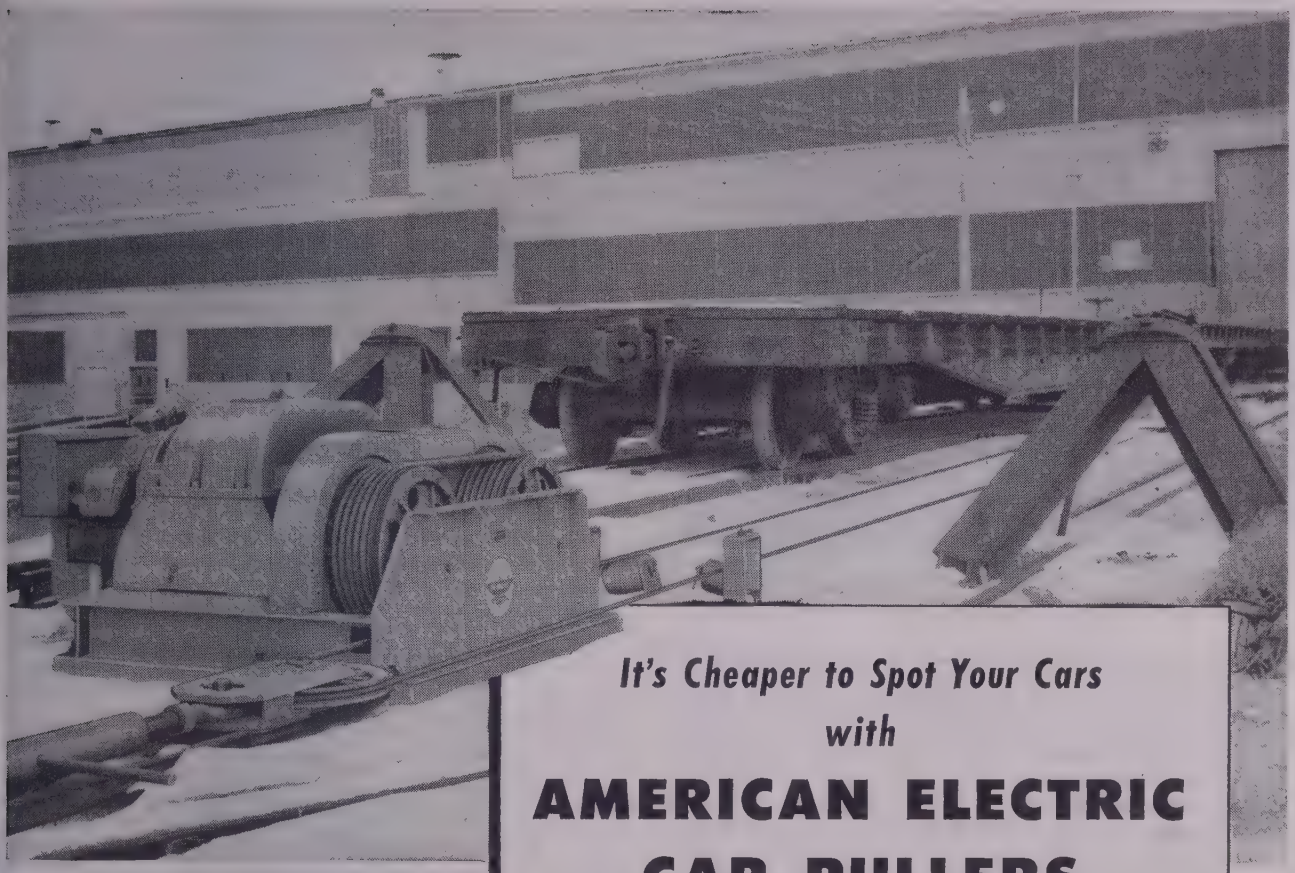
The butt weld process is somewhat simpler than the lap weld, since the latter has two operations while the former has only one, both forming and welding of the skelp being done at the same time. Skelp for butt weld pipe is not square at the end, but has the corners clipped off so that when it starts through the bell it will curve in the form of a cylinder. The skelp is charged into the furnaces by magnetic rolls, and after being heated to a welding temperature of 2500° F, the ends are seized by tongs in the hands of the welder, who then drops over the handles of these tongs a bell-shaped die. He then drops the handles of the tongs on an endless chain which grasps them and pulls tongs, skelp, and bell out of the furnace together. The bell is caught and held just outside of the furnace and the skelp forced through, forming it into a pipe, and welding the edges firmly together. In making double extra heavy butt weld pipe, on account of skelp thickness, it is necessary to draw the pipe through several dies, each of which is slightly smaller than the last, and this pipe must be reheated between each draw until it is thoroughly welded.

The pipe is carried along the endless chain to a pair of rolls called "size-rolls," the tongs being automatically released in the meantime. These rolls give the pipe the external size desired. From these rolls the pipe passes to a cooling bed on which the pieces, about 21 feet in length, are slowly rotated.

The pipe is then fed into another set of size-rolls where the final reduction is made and scale is removed, both internally and externally. From these rolls the pipe passes on to a cross-roll machine, and emerges practically straight. The pipe next rolls off onto another cooling rack which carries it past a pair of saws which cut off the crop ends and the pipe

Fig. 5—Left rear, chilled rolls, showing mandrel—center foreground, size rolls which give pipe correct outside diameter





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Made in two sizes . . . 5,000 and 10,000 lb. starting line pull. Self contained in rigidly constructed welded steel housing. Worm gear, on tapered roller bearings, operates in oil bath.

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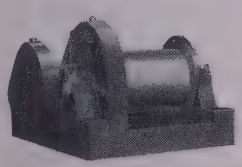
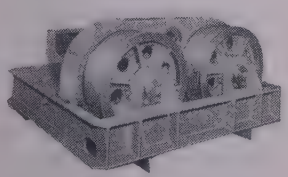
Made in six sizes . . . from 4,000 lb. to 30,000 lb. starting line pull. Welded steel beds . . . jaw clutches for disengaging drums . . . outside contracting band brakes, foot operated.



AMERICAN CONTINUOUS ROPE CAR PULLER

Individually engineered to fit the job. Quotations and plans gladly furnished on receipt of information concerning the installation.



Do YOU KNOW what it costs you to spot a freight car? Count up the minutes lost while your men are waiting for the switch engine . . . the delays that occur while each car is being spotted. At best, it's a slow, expensive process, requiring the work of several men.

With the AMERICAN Electric Car Puller, *one man* moves cars the instant you want them moved . . . gets the job done quickly . . . and spots cars to loading docks with absolute accuracy. Simple, rugged design in these Car Pullers assures dependable, trouble-proof operation. They are ready for work on a moment's notice, but never cost a penny for "stand-by" time. And in limited space, AMERICAN Electric Car Pullers eliminate completely the slow, dangerous job of moving cars manually with a pinch bar.

The three major types of AMERICAN Car Pullers shown here range in capacity from 4,000 to 30,000 lbs. They cover almost every need in industry. For helpful information on a specific installation, contact your AMERICAN distributor or write us direct. For catalog, mail the coupon below.

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Fig. 6—Cross rolls which straighten lap welded pipe and give it a truly cylindrical shape

then drops into a set of pockets. From these pockets the pipe is transferred in bundles by overhead crane to a water bosh, where all loose scale is removed, and then taken to the inspection table. After straightening and a thorough inspection, the pipe is ready for the finishing department.

Continuous weld pipe is made from coils of flat steel skelp which are 34 to 37 inches in diameter and from 259 to 519 feet in length. These coils, weighing from 597 to 2140 pounds, are checked for size and gage and are weighed preparatory to being placed in an uncoiling box. From the uncoiler the one end of the skelp is fed into a roller leveler, which renders the skelp flat and straight so the coil ends can be matched up square for welding, as well as enabling it to travel around the loop table and through the furnace. After the tail end of the first coil has been reached, the starting end of the next coil is run through to the flash welding machine where the two coil ends are joined together to form a continuous ribbon.

Fig. 7—Clipping shear which cuts and shapes end of skelp

After the weld is made the skelp passes through a trimming machine where the excess weld metal is removed. It is then reeled out quickly, by means of pinch rolls, from the trimming machine to fill up the loop table in order to have adequate furnace running time during which the coil end-to-end weld is made.

From the loop table the skelp enters the furnace which is approximately 148 feet in length and fired by 274 gas burners; 137 burners located on each side of the furnace, so the flame impinges on both edges of the skelp. Thus, when skelp emerges from the furnace, it enters forming rolls which form it in the contour of a tube, but leaving an opening between the edges. It next passes through welding rolls where the skelp edges are forced together and welded. It continues on through four additional sets of rolls which strengthen the weld as well as size and round the pipe.

Inasmuch as the skelp is pulled through the furnace by means of the pipe welding rolls at the discharge end, it is essential that the skelp body is not overheated as it must retain sufficient strength to give pressure to the weld as well as pull itself through. As the skelp emerges from the furnace, a blast of air is blown on the edges to increase the edge temperature and remove loose scale from the welding edges, as well as the top and bottom. Jets of air are played upon the edges between the forming and welding rolls to increase the temperature 150 to 200° F, thereby bringing the welding temperature up to 2500° F.

After the pipe is rolled into shape it is cut to uniform lengths by means of a flying hot saw. This saw is synchronously tied in with the speed of the mill so that it automatically cuts the desired lengths, running from 21 to 42 feet.

After being cut in lengths, the pipe is transferred to a traveling cooling rack to permit slight cooling before the descaling operation. The pipe, still at red heat, is fed into a descaler, consisting of three pairs of rolls, where a final sizing reduction is made and scale is loosened and removed, both internally and externally. The pipe is then passed onto conveyor racks for final cooling. After leaving the cooling racks it drops into pockets and is then lifted by cranes and taken to the finishing department.

In the finishing department, the butt weld pipe is first delivered to an inspection table where it is thoroughly checked for visible defects, such as crookedness, seams, open welds, laminations, blisters and rough surface spots. Passing inspection, pipe rolls off the table onto a conveyor which carries it through a straightening machine to the facing and reaming machine, which trues-up and chamfers both ends. This done, it is ready to be threaded in high speed threading machines of special design. The threaded pipe is then transferred to the coupling screwing machines, where a coupling is attached to one end of each piece. From here it moves to the

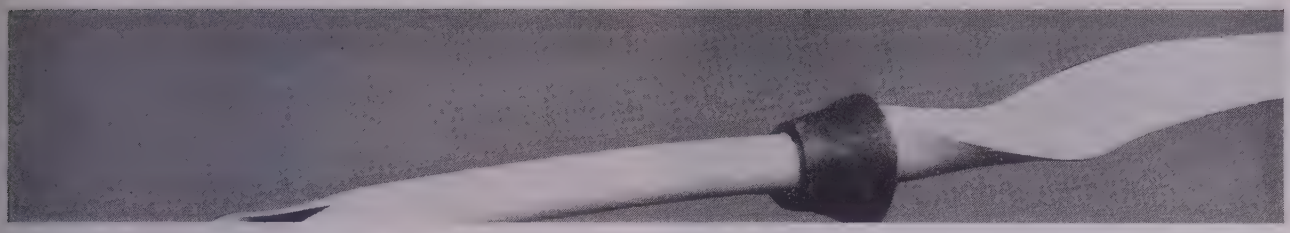


Fig. 8—Illustration of how skelp is bent and welded as it is drawn through the welding bell

Electric Metallic Tubing

hydrostatic testers, where it is checked by applying, internally, a hydrostatic pressure which varies from 700 to 2200 pounds per square inch, according to the size and kind of pipe and use to which it is to be put.

Unless otherwise desired, the pipe is next given a coating of oil by passing it through an oiling machine. The last step in finishing takes place at the bundling tables, where the finished pipe is again inspected, bundled and tagged.

In the finishing of galvanized butt weld pipe, material is transferred to the galvanizing department after it leaves the hydrostatic testers. Upon completion of galvanizing, it is returned to the finishing floors, and follows the same route as black pipe with the exception that it is not oiled.

Galvanized pipe is coated with spelter or, in other words, it has a zinc coating inside and outside to prevent rust. Both butt weld and lap weld pipe is galvanized in the following manner.

The first process is to dip it into a solution of caustic soda to remove oil and foreign matter from the pipe. Next, it is thoroughly cleaned of all mill scale by a pickling process. This consists of immersing the pipe into a bath of sulphuric acid. It is then given two clear water rinses to neutralize any acid remaining and then dipped into a flux tank. The flux enables the zinc to adhere easily to the pipe.

From here the pipe is lifted to the galvanizing tank, where it is given a coating of zinc, inside and outside, by allowing it to remain in the bath for a regulated period of time. After being withdrawn from the tank, material is transferred to a cooling rack which carries it through a cooling bosh and then to an inspection table.

The pipe is now inspected and returned to the finishing floor where it is handled in the same manner as black pipe except for the oiling process.

Edison's lighting system was announced late in December 1879; the first commercial installation was put in operation in the following May. By the end of 1884, over 500 plants were in operation in the United States, supplying more than 100,000 lamps. In 1886, Westinghouse announced the alternating current system and showed its applicability to lighting. The demand for electric illumination then assumed enormous proportions. In general, the wiring of early installations, according to modern standards, was crude, often careless and unsafe. At first, wires were run exposed, attached to wooden cleats. Soon they were covered with surface wooden moldings or buried behind plastered walls; in damp places and with only paraffined braid coverings, trouble soon developed. Underwriters' organizations gradually evolved codes of rules for wiring but actual experience was necessary to demonstrate which types of equipment were safe and durable.

What was probably the first conduit system was installed by Greenfield in 1888; zinc tubes with copper elbows were employed. In 1889, Johnson and Greenfield announced an insulating paper-tube conduit into which wires could be pulled after the conduit was permanently in place and building operations had been completed.

Merits of the conduit system were recognized at once and many miles of the paper tube were installed during the next two years. Other makes of insulating conduit appeared, with woven fabrics, fiber and even "flexible" glass as the insulating and sheathing material; these, however, do not appear to have had the vogue of the paper tube. In fact, for nearly a decade, the products of Johnson's organization enjoyed practically a monopoly of the conduit installations for interior wiring.

In 1891, durability of the existing tubes having been found inadequate, the Johnson-Greenfield paper tube was offered encased in thin sheet brass or steel armor. This gave a notable increase in mechanical strength and from 1891 to about 1895 most lighting

Fig. 9—View showing discharge end of furnace and drawbench chain

Fig. 10—Flash welder which joins the coils together and general view of entry end of continuous furnace

installations used the brass-armored tube. However, its mechanical strength not being all that could be desired, the next step was to insert the paper tube in gas pipe. Such a product was announced in April 1891, but it had a low space factor due to the thickness of the insulating lining. In 1894, a thinner paper wall was provided and proved more acceptable. Other companies began to produce gas pipe conduits, lined with wood, with fiber, or with a clay-base composition material.

As early as 1890, wiring systems had been installed in plain unlined iron gas pipe with apparent success. The relative simplicity and cheapness of the method,

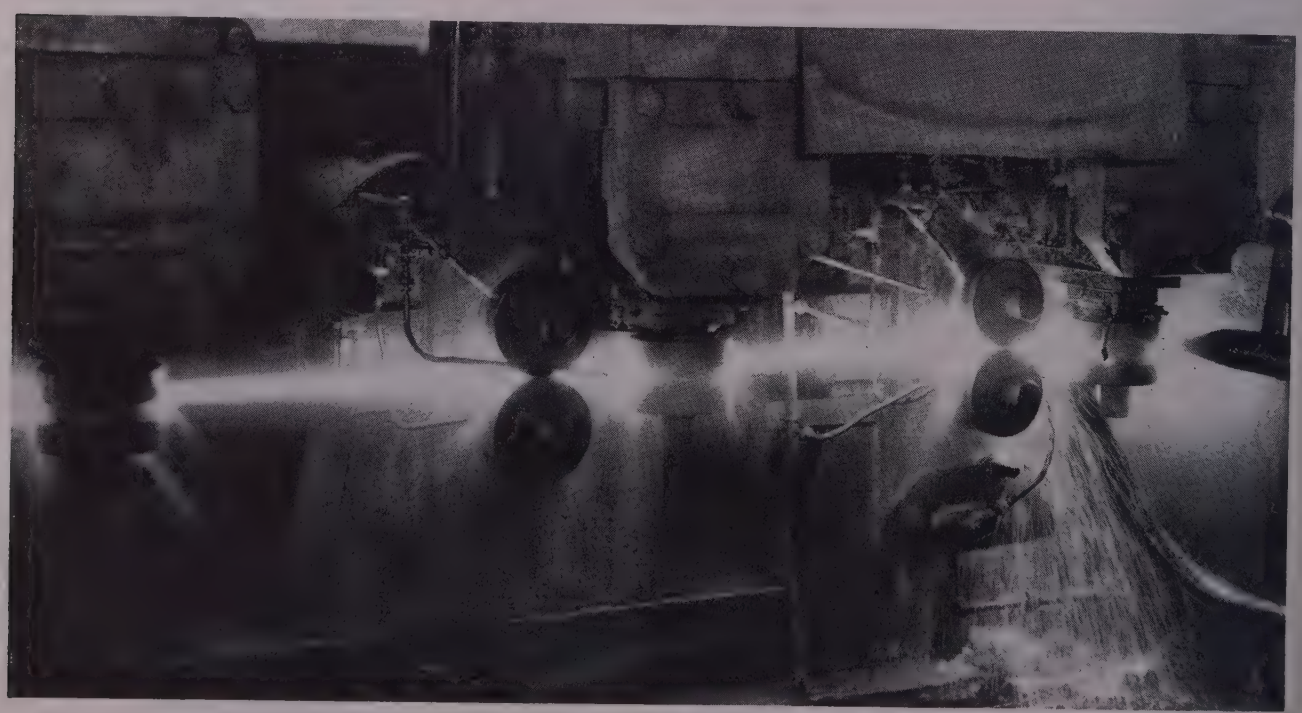
Electric Metallic Tubing

combined with the strength of an iron-pipe conduit, were attractive characteristics. For 5 years or more proponents of insulated and non-insulated conduit waged wordy battles as to the merits of their respective systems. The first National Electric Code, formulated in 1896 and published in 1897, permitted wiring in both types, although requirements for the noninsulated conduit were considered contradictory and excessive by the proponents of that method. The "un-insulated" enameled product immediately became in great demand and, in 1898, at least two companies were turning out many tons of conduit per day. From then on use of insulated conduit dwindled rapidly and by 1903 it was practically uncalled for in new construction. The loss of insulating ability, when lined pipe was bent on the job, was probably the chief factor in bringing about its gradual disappearance.

The first "approved" unlined electrical conduit of 1897 was a pipe substantially of standard weight, coated with enamel inside and out. Pipe galvanized by an electrolytic method was being produced and as early as 1902, pipe zinc coated by the sherardizing process appeared in 1908 while the product of the hot-dip process came out in 1912.

From 1897 to 1899, steel tubing with a wall thickness some 35 per cent below standard pipe dimensions was being offered, but apparently it was used only to a limited extent, because it did not have sufficient mechanical strength to withstand the conditions to which it was subjected during building construction. About 1926, a tubing with wall thinner than normal

Fig. 11—Forming and welding machine where skelp is transformed from a flat to a cylindrical shape in the first pair of rolls, welded in the second pair, and reduced to the proper diameter in the following rolls



This Nicholson cartoon ad is one of many appearing monthly in *The Saturday Evening Post.*

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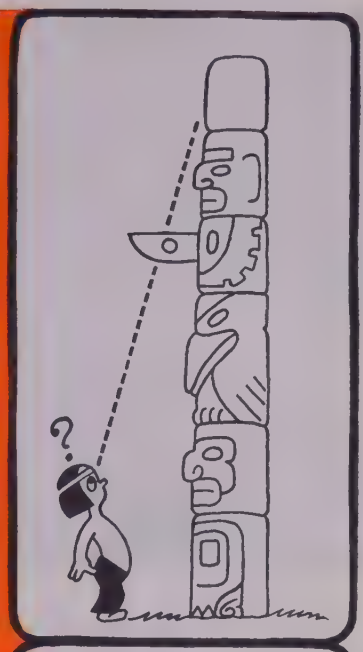

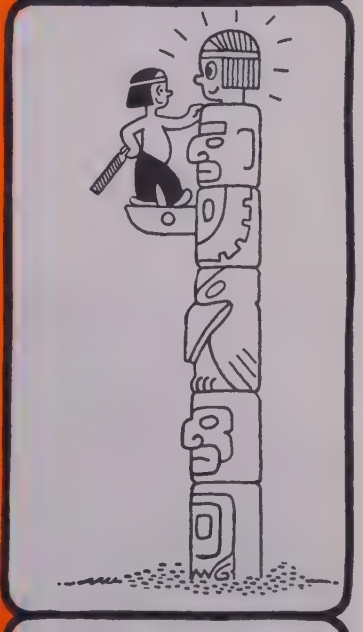

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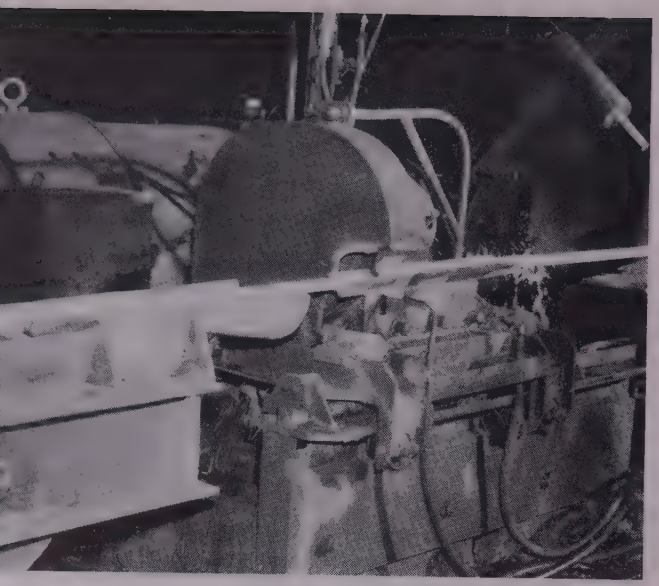


Fig. 12—Flying hot saw showing continuous pipe being cut into uniform lengths

was again offered to the electrical trade; in this product the wall thicknesses were less than half of the standard values; no threads were cut at the ends of a length but junction was executed with clamping couplings. The material was approved for exposed wiring in dry places (1928 edition of the code).

Using a somewhat arbitrary division, it might be said that the first 15 years produced the present-day type of rigid conduit, the evolution having taken place, in large part, along lines dictated by engineering considerations. The last 25 years have seen practically no basic engineering changes. During this long period of experience with rigid conduit, galvanized or enameled and under the pressure

Fig. 13—Hydrostatic tester which subjects pipe to an internal water pressure of from 700 to 2200 pounds per square inch

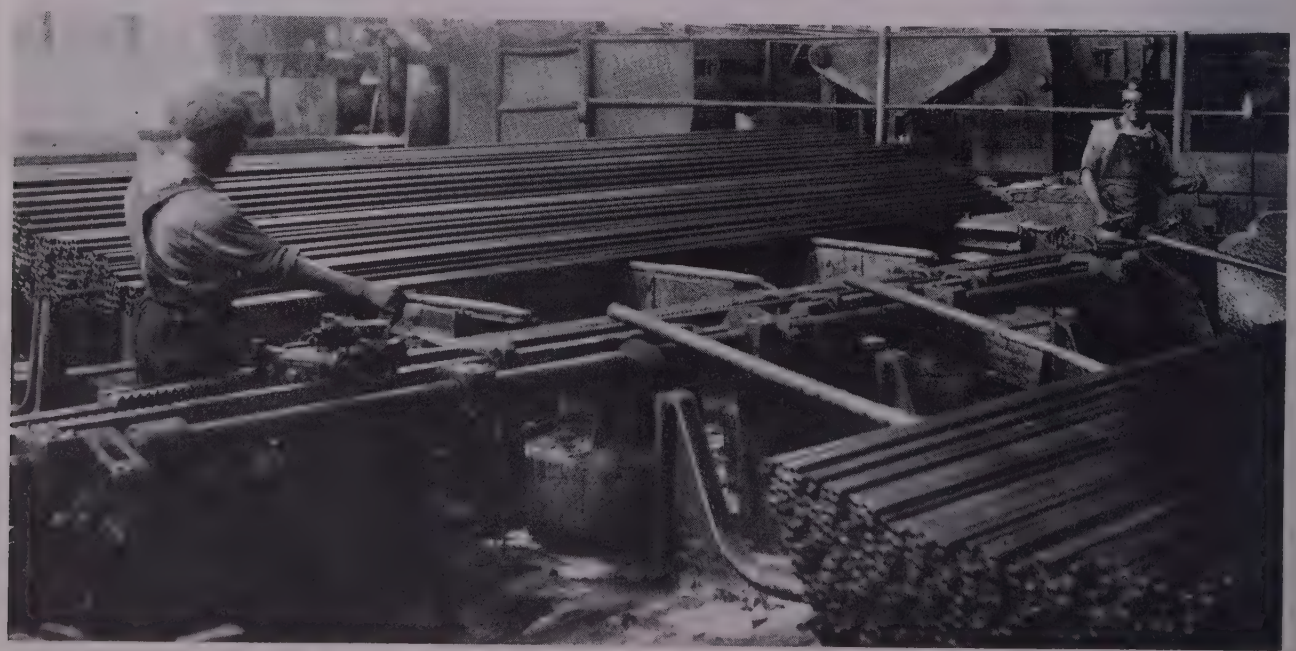
Electric Metallic Tubing

of a variety of influences, it has become almost general practice to require the use of rigid conduit as a wire raceway for all wiring work in fireproof building construction. In some localities, due to influence discussed in some detail on later pages, rigid conduit has been required for all wiring for light or power.

Conclusion indicated by this investigation is that practical experience gained by the trial and error method, and a determination to have a conduit that was less expensive, fireproof, possessed of sufficient mechanical strength and permanently enduring, were factors which dictated the modifications of the older types and the acceptance of the new. Although no systematic engineering investigation appears to have been made to determine the proper limits for its various essential characteristics, the fact that the present-day type of rigid conduit has been in use, practically unchanged, for 25 years, testifies to the general suitability of the product so evolved.[4]

Rigid steel conduit is supplied in the following finishes and is manufactured from specially selected standard wall pipe: Enameled, electro galvanized, hot galvanized and sherardized; and in sizes: ¼, ⅜, ½, ¾, 1, 1¼, 1½, 2, 2½, 3, 3½, 4, 4½, 5, and 6 inches.

One coupling is furnished with each length and the length of finished conduit, including coupling is 10 feet. A tolerance of plus or minus ¼-inch is applicable to the required length in each size. Pitch and form of threads must conform to the American (Briggs) standard for pipe threads. Each length carries an Underwriters' label to show that the material fully meets their standard and is approved for use. Field representatives of the Underwriters' Laboratories, which is sponsored by the National Board of Fire Underwriters, regularly visit plants in which rigid conduit is being manufactured to inspect the finished product. They also make checks to insure



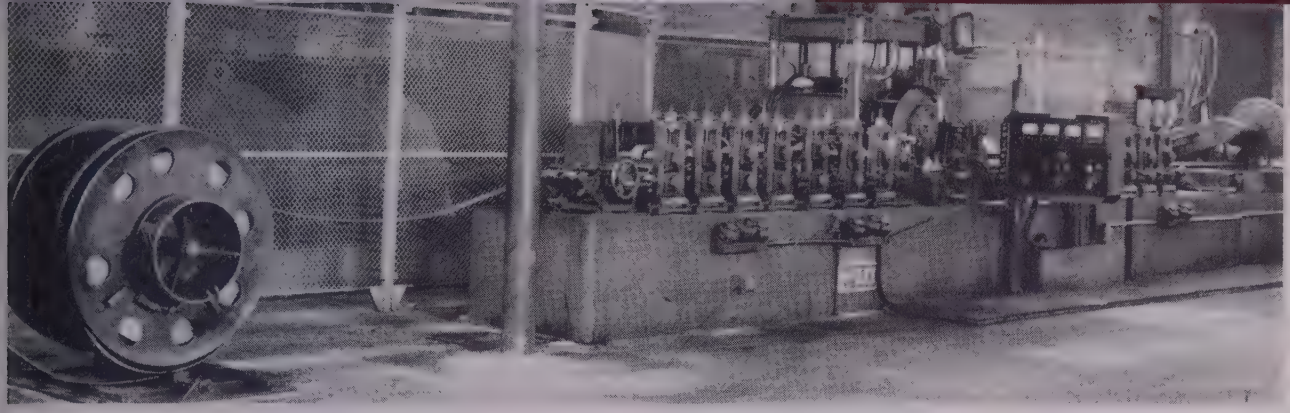


Fig. 14—Modern continuous mill for the production of mechanical tubing

Electric Metallic Tubing

that the enamel being used is up to standard and that the zinc coating is adequate. Naturally, interior surfaces are also given a close inspection, as it is of prime importance that no defects are present that would cause injury to the insulation of conductors.

E.M.T. (electric metallic tubing) is made from strip steel which is electrically welded and, in the main, is furnished in electro galvanized finish with an enameled interior. However, some quantity is supplied with a hot-galvanized finish and during the emergency manufacturers were permitted to supply in a black enameled finish. This product came into use about the year 1928 and has been gaining in popular favor steadily since that time.

It is approved under the National Electrical Code and the Underwriters' Laboratories and the same care and special inspection is given this product as that of rigid conduit. It is furnished unthreaded in 10 foot lengths and its installation is accomplished by the use of special fittings.

The nominal inside diameter of the product is approximately the same as rigid conduit while the side wall is about one-third the thickness. It is used mainly where service is less severe and the need for mechanical protection not as exacting as in applications where the heavier rigid conduit is used. Each length carries the Underwriters' Laboratories label and their field representatives check its manufacture carefully. It is supplied in the following trade sizes: ½, ¾, 1, 1¼, 1½, and 2 inches.

Formed or mechanical tubing, as it is popularly designated, is produced from either hot or cold-rolled strip steel. It is, in the main, made from light gage strip and differs from regular pipe in that it is all cold-formed and only the edges of the strip are heated to welding temperature. This means that the balance of the pipe circumference has not been subjected to heat and results in a product with an excellent surface finish and desirable physical properties.

The strip used (mainly cold-rolled because of its better surface) is either single-rolled or gang-slit. It is rolled or cut to the desired width for the desired outside diameter of the pipe to be produced and is passed through a series of vertical and horizontal rolls where it is rolled into a circular form. Just before the formed tube enters the welding unit, it is opened up slightly by a spreader or fin rolls to prepare it for the following welding operation. In welding, since the heat band is confined to a very narrow area, a flash is thrown up both on the outside and inside of the tubing. The outside flash is always trimmed off and, dependent on its use, the inside flash is either rolled down or cut off mechanically. The tubing is welded either by the electrical resistance process or by the use of gas.

After the tube leaves the welding unit, it passes through a series of sizing and straightening rolls which effect the close outside diameter tolerances so necessary in the product. It is then cut to length and the ends reamed, chamfered or face cut, as the customer specifies.

Mechanical tubing is manufactured in range of sizes from ¼ to 5-inch outside diameter and mainly in gages from 22 (0.028) to 8 (0.165), although some is supplied to as heavy a wall as 3 (0.259), all of the foregoing being Birmingham wire gage. The general use is fairly well confined to sizes of 2 inches and under and not heavier than 10 Birmingham wire gage (0.134). Its use is increasing rapidly and it is gaining in favor in applications where surface finish, close wall thickness and outside and inside diameter tolerances are highly important. It is also coming into general use for pressure tubing such as heat exchanger and boiler tubes. These are heat treated and give really excellent performance in service.

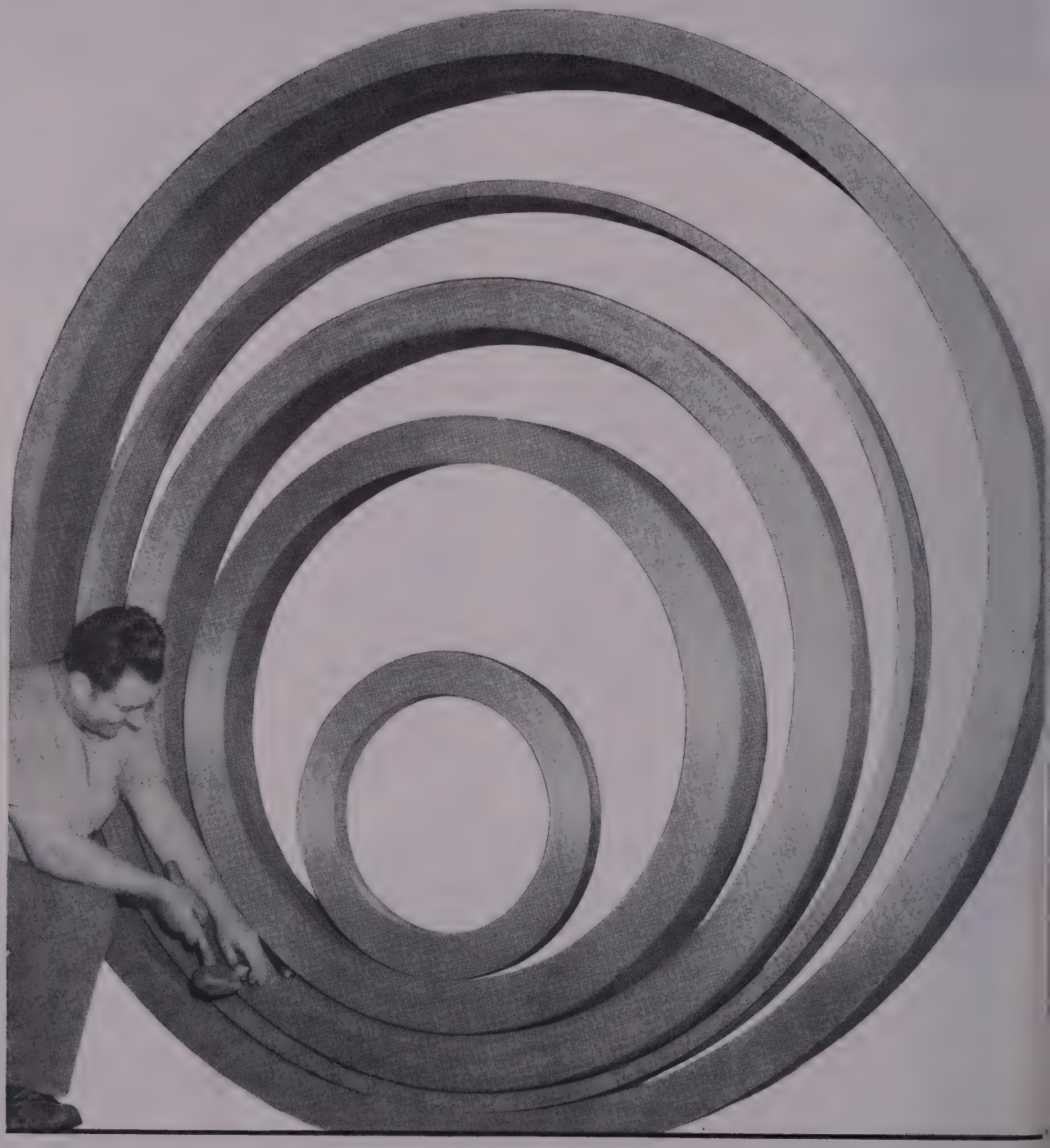
Mechanical tubing is generally furnished in carbons 0.35 and under, with the greater amount in 0.10 carbon. However, some electrically welded stainless and alloy tubing is now being produced. Its use is so general and application so varied in forming, expanding and flanging that to enumerate them would be an endless task. However, the following are some of the better known uses: Chair and furniture tubing—both chrome plated and enameled, bicycle tubing, automotive steering columns, tair and muffler pipe, drive shafts, oil liner, breather pipes, etc., heat exchanger and boiler tubing.

Household appliances—washing machine parts, lawn mower and baby carriage handles, vacuum cleaner parts, fan standards, in addition to shot well casing —for oil country use.

REFERENCES

1—Sparks, Spring 1943 issue published by Girdler Corp., formerly Tube Turns Inc., Louisville.
2—The Making, Shaping and Treating of Steel, pages 1024-25, 1925 edition published by Carnegie-Illinois Steel Corp., Pittsburgh.
3—Iron and Steel Engineer, Nov. 1945 issue published by Association of Iron and Steel Engineers, Pittsburgh.
4—Report No. 89500 by the Trade Extension Committee of the National Electrical Manufacturers' Association.

RINGLEADERS in



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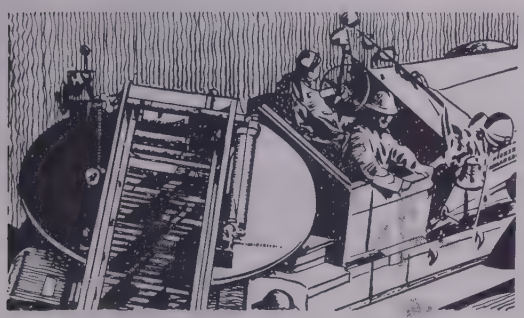
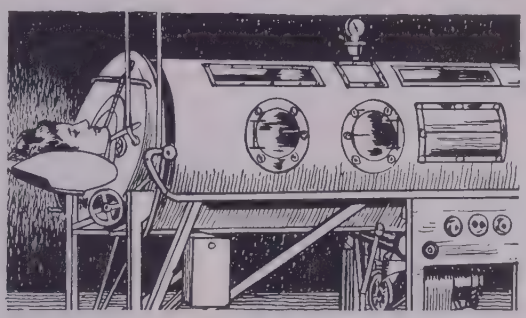
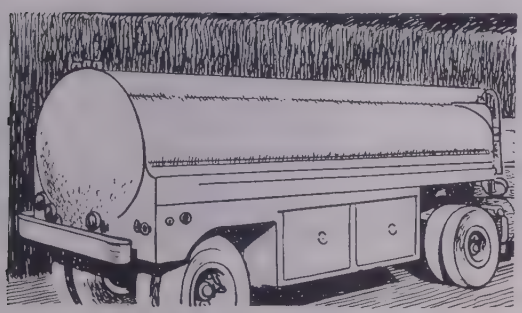


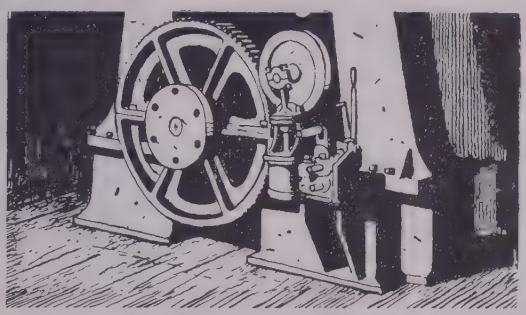
In bearing rings on elevated ladder fire-trucks, Standard weldless rings provide the strength and toughness necessary to withstand the loads.



The iron lung—which has saved the lives of many polio patients—is another important and unusual application of Standard weldless rings.



The unusual support and reinforcement problem encountered in glass-lined milk trucks has been successfully solved by the use of Standard weldless rings.



The uniform structure of Standard weldless rings is highly important in gear blanks where a welded area might affect tooth strength or finish.

The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U.S.A. Offices: Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington.

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Standard's three-unit mill, each composed of a horizontal mill and two steam hammers for preliminary operations, can roll practically all sizes of rings up to a maximum of 12 feet outside diameter. Let us quote on your requirements.

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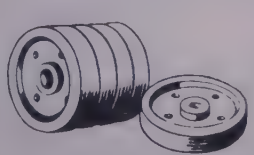
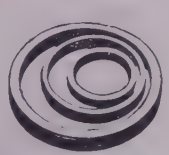
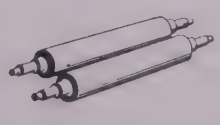


WHEEL MILL PRODUCTS

STEEL CASTINGS



WELDLESS RINGS



FORGINGS

CONTOUR GRINDING

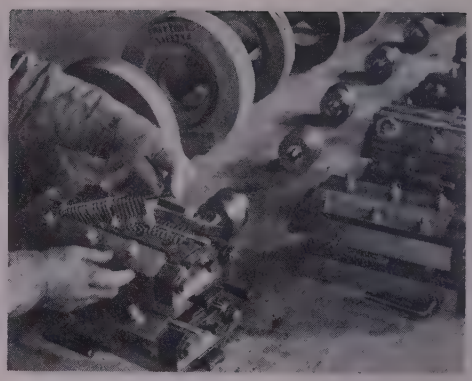
4000 Parts per Hour

MASS production of simple or intricate contours in small metal parts is carried out by a crush grinding machine, control of which is automatic throughout the entire working cycle after the original setting. The Truformatic machine illustrated, made by Thompson Grinder Co. of Springfield, O., is producing convex and concave finished edges on lock stampings at the rate of over 65 per minute.

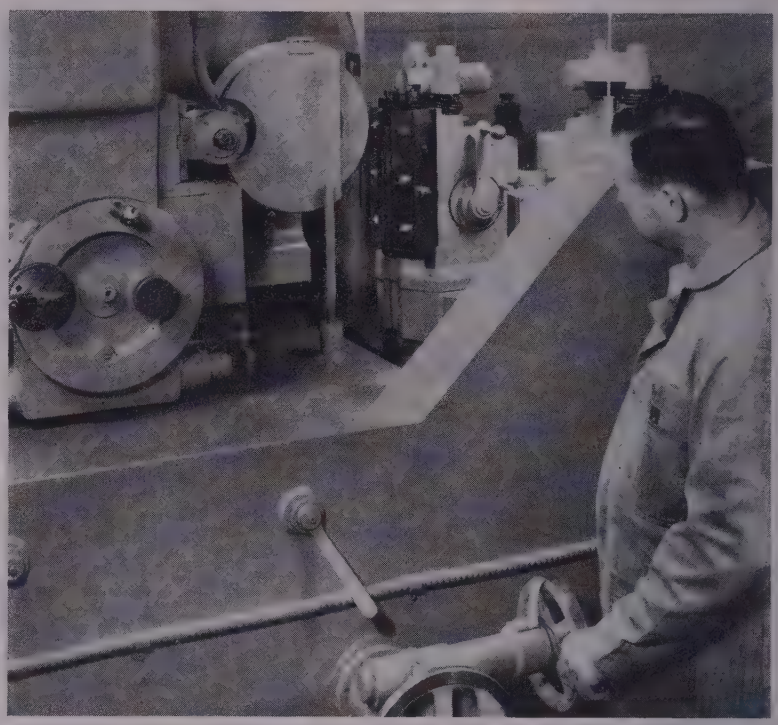
Fixtures are loaded with about 160 stampings and the fixture is then loaded onto the indexing table which has two vertical faces for fixtures. The table turns 180 degrees and the work is brought into position for grinding. Simultaneously, on the other side of the rotating table, the fixture with the finishing work is ready for unloading and refilling.

Wheelhead moves in horizontally to contact with the work on the table and the indexing table rises to a preset stroke. Work is ground in a single pass as the form is transferred from the wheel and ground into the metal parts. Worktable stroke is variable from 3 to 16 inches at any feed rate up to 15 fpm. Table returns to loading height after the wheelhead retracts and then indexes ready for the cycle to repeat. The machine finishes 160 parts per cycle with about 25 cycles being completed each hour. Production thus is about 4000 parts per hour.

Right—Operator loading Truformatic fixture with 160 small stampings. Other parts with their respective fixtures and master contour rolls and grinding wheels in background



Below—View of grinder showing relationship of master roll to grinding wheel and position of work table and fixture before grinding



AWS Holds 30th Annual Meeting

AMERICAN Welding Society will hold its 30th annual meeting at the Hotel Cleveland, Cleveland, during the week of Oct. 17. The meeting will be held in conjunction with the National Metal Exposition at the Cleveland Public Auditorium.

The program includes technical sessions every day, Monday through Friday, and several special features. A total of 77 technical papers are now scheduled for the 21 technical sessions.

Special features are the awarding of medals and prizes, and the Adams Lecture on Monday evening, Oct. 17, the president's reception on Tuesday evening, and a business in welding forum on Thursday evening. The educational lecture series will again be given with lectures scheduled for Monday, Tuesday and Wednesday afternoons. The board of directors' and the business meetings will be held on Wednesday afternoon.

A departure from previous AWS convention programs is the elimination of the annual dinner and scheduling of the president's reception for Tuesday evening instead of Sunday afternoon as in the past. An informal get-together and registration will be available for those who arrive in Cleveland on Sunday, Oct. 16.

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Nodulizing Alloy

(*Continued from Page* 83)

on the use of magnesium in the deoxidation of cast steel. Ferrosilicon was selected as a carrier because of its compatibility with magnesium at high temperatures and because an alloy of this type would not introduce undesirable elements into the steel.

When it became generally known that magnesium could be used to nodulize the graphite in cast iron, the iron-silicon-magnesium alloy was introduced into molten cast iron with immediate success. All test heats were induction melted in a magnesia lined furnace and superheated to 2650° F for tapping. The iron was tapped into a preheated clay-graphite crucible on the bottom of which was spread the iron-silicon-magnesium alloy. Most of the heats were made of Armco iron with Mexican graphite and 50 per cent ferrosilicon added in sufficient quantities to produce the desired compositions. A few heats were made of steel scrap base and the rest were made of commercial pig. The initial heats were treated with an iron-silicon-magnesium alloy prepared from a low aluminum ferrosilicon base. Subsequent heats were inoculated with an alloy prepared in a regular grade ferrosilicon base which contains approximately 2 per cent aluminum. The reaction between the molten metal and the magnesium alloy was quiet with only a moderate amount of flare and no ejection of metal from the crucible. The treated iron was poured shortly after the magnesium addition. Holding power tests of the treated metal held in a crucible in a gas-fired furnace indicated no loss of nodulizing power in castings poured 16 minutes after treatment.

First tests were made on low sulphur irons containing approximately 0.03 per cent sulphur. Introduction of 0.03 per cent magnesium resulted in refinement of the flake graphite while some nodules were produced with a 0.06 magnesium addition. When 0.08-0.10 magnesium was added, a completely nodular structure was produced, provided the residual magnesium was above 0.06 per cent, and the silicon above approximately 2.2 per cent, Fig. 1. The carbon content apparently had relatively small effect in the range of 2 to 3.7 per cent.

Silicon contents lower than 2.2 per cent resulted in the occurrence of hard carbides (cementite) in the matrix of the iron. As shown in Fig. 2 increasing amounts of silicon first eliminate the carbide phase and then decrease the pearlite/ferrite ratio in the matrix. Table I shows effect of silicon and magnesium on the microstructure of low (0.03) sulphur irons.

Variations in carbon content merely resulted in changes in the amount of nodular graphite present. Fig. 3 shows effect of increasing carbon

TABLE I

EFFECT OF SILICON AND MAGNESIUM ON LOW SULPHUR IRONS

Heat	Si	C	Mn	P	Sulphur		Magnesium		% Mg	Nodules	Carbides	Quasi
					Orig.	Final	Added	Resid.	Recovery			Flake
608–2	1.11	3.82	0.47	.005	.03	.03	.03	.02	67			*
608–3	1.12	3.67	0.43	.005	.03	.023	.06	.06	100	X	*	
608–4	1.25	3.53	0.42	.005	.03	.027	.09	.09	100	X	*	
600–2	1.32	2.13	0.75	.008	.03	.024	.09	.04	44	X	*	
605–3	1.95	2.61	0.44	.008	.03	.024	.16	.14	88	*	*	
605–2	2.13	2.69	0.44	.008	.03	.022	.08	.03	38	*		X
613–2	2.16	3.62	0.86	.007	.03	.03	.12	.05	42	*		X
600–3	2.20	2.06	0.75	.006	.03	.022	.15	.12	75	*	X	
614–4	2.29	2.68	0.54	.006	.03	.023	.12	.07	58	*		
605–4	2.38	2.46	0.44	.007	.03	.026	.24	.22	92	*	X	
613–4	2.45	3.69	1.34	.005	.03	.021	.12	.07	58	*		
613–3	2.46	3.74	0.84	.007	.03	.03	.12	.05	42	*		X
597–2	2.51	3.66	0.45	.003	.03	.029	.03	.01	33			Flake
614–2	2.52	2.68	0.53	.006	.03	.025	.12	.07	58	*		
616	2.52	3.31	0.44	.007	.03	.024	.12	.11	92	*		
613–1	2.59	3.54	0.44	.007	.03	.028	.12	.05	42	*		*
598–2	2.62	2.84	1.01	.014	.03	.022	.04	.04	100	*		*
597–3	2.72	3.56	0.45	.003	.03	.021	.06	.05	83	*		*
614–3	2.82	2.71	0.53	.006	.03	.020	.12	.07	58	*		
600–4	2.83	1.97	0.74	.006	.03	.026	.21	.15	72	*		
607–3	3.03	2.33	0.40	.005	.03	.014	.48	.38	79	*		
598–3	3.08	2.58	1.00	.010	.03	.026	.08	.08	100	*		
597–4	3.16	3.20	0.44	.003	.03	.022	.09	.09	100	*		
607–2	3.59	2.60	0.42	.006	.03	.03	.24	.22	92	*		
598–4	3.81	2.63	0.99	.010	.03	.020	.12	.12	100	*		
609–4	3.83	2.47	0.47	.010	.03	.024	.12	.09	75	*		
609–3	3.83	2.62	0.47	.010	.03	.024	.08	.06	75	*		X

* = Major Constituent
X = Minor Constituent

TABLE II

EFFECT OF SILICON AND MAGNESIUM ON HIGH SULPHUR IRONS

Heat	Si	C	Mn	P	Sulphur		Magnesium		% Mg	Nodules	Carbides	Quasi
					Orig.	Final	Added	Resid.	Recovery			Flake
610–2	1.20	3.84	0.49	.005	.10	.06	.04	.03	75			*
611–2	3.43	2.93	0.49	.004	.10	.06	.04	.01	25			Flake
604–2	1.61	3.91	0.42	.010	.10	.08	.06	.04	67			*
612-2	1.11	3.94	0.47	.035	.08	.076	.08	.03	38			*
610–3	1.13	3.95	0.50	.005	.10	.06	.08	.06	75			*
606–2	2.04	2.93	0.42	.006	.10	.07	.08	.04	50			*
611–3	3.51	2.96	0.48	.004	.10	.08	.08	.06	75	X		*
610–4	1.10	3.99	0.50	.005	.10	.06	.12	.09	75			*
612–3	1.68	3.38	0.47	.005	.10	.03	.12	.06	50	*	*	
604–3	2.09	3.81	0.44	.010	.12	.04	.12	.09	75			*
599–3	2.30	2.62	0.96	.010	.12	.05	.12	.11	92			*
599–4	2.46	2.57	0.96	.010	.14	.08	.12	.11	92			*
611–4	3.45	2.86	0.48	.004	.12	.05	.12	.09	75	*		*
599–2	2.53	2.54	0.98	.009	.06	.05	.12	.11	92			*
606–3	2.20	2.64	0.42	.005	.12	.04	.16	.10	63	*	X	*
615–4	2.92	2.65	0.95	.007	.08	.04	.20	.11	55	*		
621–1	3.73	2.68	0.44	.006	.10	.04	.20	.07	35	*		
620–1	3.61	2.95	0.47	.008	.10	.03	.20	.07	35	*		
612–4	1.61	3.51	0.46	.005	.12	.03	.24	.09	38	X	*	
606–4	2.06	2.83	0.42	.004	.12	.05	.24	.16	66	X	*	
615–3	2.27	2.92	0.97	.007	.12	.07	.24	.11	46	X		*
621–2	3.75	2.47	0.43	.006	.12	.06	.30	.12	40	*		X
620–2	4.00	2.39	0.45	.006	.12	.02	.30	.15	50	*		

* = Major Constituent
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SS-48

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TABLE III

TENSILE STRENGTHS OF NODULAR CAST IRONS

Heat	Si	C	Mn	P	Sulphur Orig.	Sulphur Fin.	Magnesium Added	Magnesium Fin.	Mg Rec. %	UTS	% EL	Remarks
620-1	3.61	2.95	0.47	.008	.12	.03	.20	.07	35	67,000	3	As-cast
620-1A										60,000	4	Annealed*
620-2	4.00	2.39	0.45	.006	.12	.02	.30	.15	50	83,500	8	As-cast
620-2A										82,500	18	Annealed*
621-1	3.73	2.68	0.44	.006	.12	.04	.20	.07	35	71,000	4	As-cast
621-1A										60,000	1.5	Annealed*
												Bad Spec.
621-2	3.75	2.47	0.43	.006	.12	.06	.30	.15	50	82,500	9	As-cast
621-2A										77,500	7	Annealed*
												Bad Spec.

*Annealed 6 hours at 1650° F.

content in increasing the size and number of nodules.

Part of the investigation covered the action of the alloy on irons with sulphur contents above 0.03 per cent. It was found that while under laboratory conditions, 0.08 magnesium was adequate to completely nodulize a 0.03 sulphur iron, additional magnesium must be added to irons of higher sulphur content. Magnesium acts as a desulphurizer in high sulphur irons and as such, it acts to reduce the sulphur content of the iron below the 0.04 limit required for nodulation of the graphite. The actual quantities of the iron-silicon-magnesium alloy to be added to high sulphur irons must be determined experimentally since there is some evidence that the condition of the melt has some bearing on the amount of magnesium required. Its presence as a residual in quantities greater than 0.08 per cent in the cast iron does not have a deleterious effect on the structure of the alloy. Table II shows the effect of silicon and magnesium on irons with sulphur contents greater than 0.03 per cent. Fig. 4 shows the effect of residual magnesium and silicon on structure of cast iron.

Since this investigation was conducted mainly along metallographic lines, tensile data on keel block specimens required by the high shrinkage nodular cast irons are limited. However, tensile strengths above 80,000 pounds per square inch and elongations of 8-9 per cent were obtained in the as-cast condition. Table III gives tensile results obtained during the investigation. A patent application is now on file covering the use and composition of this alloy.

FOR CLOSE QUARTERS: This 7½-ton English crane, offered to American users through Coles Cranes Inc., Chicago, is particularly suitable for railroad application inasmuch as its cantilever type boom is mounted on a centrally situated frame. In the horizontal position with the crane close to a gondola car, this feature is said to allow for successful operation, narrow aisles being no problem. It has a turning cycle of 40 feet and will travel at 2 mph loaded and 5 mph unloaded on level ground. Four motions—hoisting, swinging, derricking, travelling—are operated by separate motors. Pneumatic tired wheels and centralized steering make the materials handling unit highly maneuverable

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(3) C. K. Donoho, "Producing Nodular Graphite with Magnesium", *American Foundryman*, Feb. 1949.

New Aluminum Sheet Alloy

PHYSICAL properties of 150S general-purpose aluminum sheet alloy developed by Permanente Products Co., Oakland, Calif., in its various tempers were established on the basis of a yield strength and workability that would be suitable to the widest range of applications. The alloy has nearly the workability of 3S for corresponding tempers and has strength intermediate between 3S and 52S alloys. It is also said to have good finishing characteristics and resistance to salt spray corrosion.

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AMERICAN Management Association, 330 W. 42nd St., New York 18 N. Y., is offering, for a nominal fee seven booklets in its production series. Titles of the booklets are as follows: New Controls for Fixed and Variable Costs; Building Quality into Manpower; Administrative and Statistical Techniques of Quality Control; Managements Role in Industrial Mobilization; The Basis of Production Planning; Building Worker Interest in Production Problems; and Organization Teamwork in Production.

New Books

The Economic Facts of Life, by Merle D. Schmid, director, Industrial Management Engineers; series of four booklets entitled *The Why of Work, Buying with Hours, We Have What We Make, Progress Through Productivity,* 20, 24, 24, 24 pages respectively; published by Industrial Management Engineers, Chicago, for $2.25 per set.

In these booklets the economic facts of American business are explained in language easily understood by the average industrial foreman or worker. It is the author's opinion, after his more than two decades of experience in dealing with foremen and industrial employees, that much of the disturbance in labor relations is due to the academic presentation of the ABC's of American business. He has attempted to present the principles of American economics to the rank and file in a simple, straightforward language, attempting to overcome the present misrepresentation of the American business system.

The booklet, *The Why of Work,* explains how men produce and exchange goods and services and it emphasizes that production is controlled by man's wants. *Buying with Hours* discusses money, cost and prices. It is stated that the important yardstick of the standard of living is not how much is earned or how much is paid for merchandise, but how many hours have to be worked to buy what is needed and wanted. The fact that regardless of what promises were made by union management or government, we cannot have any more than we produce, is brought out in the third booklet, *We Have What We Make.* The author discusses the reasons and methods employed in raising the United States to the economic leadership of the world in the last booklet, *Progress Through Productivity.* Each of the booklets is illustrated with cartoons pertinent to the text. Illustrations are reproductions of charts used in conference training classes in plants.

—o—

Trolley Conveyors, by Sidney Reibel, materials handling consultant, Albert Kahn, Associated Architects and Engineers; cloth, 265 pages, 6¼ x 9¼ inches; published by McGraw-Hill Book Co. Inc., New York, N. Y., for $4.00.

Although developed and brought to its present perfected form only within the last 25 years, the trolley conveyor is used more often and extensively than many of the older conveyor types. This book is intended to be a manual offering specific information designed to help the reader solve a wide variety of materials handling problems. It covers all types of trolley conveyors including effective design, proper selection, laying out the path of a conveyor and operational and maintenance techniques.

Author states in his preface that the book is written to fill the need for work that can be used as a reference for those who must study, design, manufacture, operate or purchase trolley conveyors. Original tables, data and methods are available for the first time, establishing a definite basis for trolley conveyors selection and design. Quick reference tables provide statistics such as chain strength and sizes, power requirement for the drive, etc. The book is profusely illustrated with pictures, line drawings and charts. All of the tables are located in one section of the book. Included is a list of visual aids available. Beside subjects on various trolley conveyor components, chapters on general features, what to buy, laying out the conveyor, attachments, guards and runaway stops, calculating chain pull and special conveyors are included.

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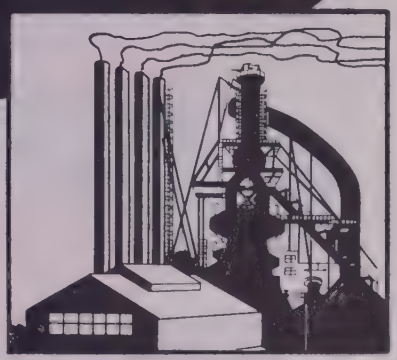

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Pimpling of Die Castings

(*Continued from Page 88*)

aluminum die cast burner head used on a home gas range. Fig. 4 portrays the results obtained when a group of similar die cast burner heads were subjected to different temperatures. The alloy contained 4 per cent copper, 5 per cent silicon, 2 per cent nickel, the balance being essentially aluminum.

1050° F Too High—Castings 1 and 2 were heated for four hours at 1050° F. This temperature is above the solidus of the alloy, hence melting began. Therefore, 1050° F is obviously too high to be used as a pimpling test for this alloy.

Castings 3 and 4 were heated for 15 hours at 950° F. Casting 3 blistered badly while No. 4 showed only a few blisters. Casting 3 therefore contained much more mechanically trapped and compressed air, or at least the air was distributed so as to cause excessive pimpling and distortion. Since 950° F is below the solidus of the alloy, no melting occurred; 950° F represents a good testing temperature for this purpose if it is necessary to determine pimpling tendencies just under the melting temperature.

Castings 5, 6, and 7 were heated 1½ hours at 950° F, examined, replaced in the furnace, and heated an additional 8½ hours at 950° F. The pimples shown in the photograph were present after 1½ hours and no further change was noted upon reheating.

Summary of Causes—Pimpling of aluminum die castings which have been subjected to elevated temperatures is largely due to air mechanically trapped and compressed when the casting was produced. The problem is seldom encountered in commercial quality castings made in cold chamber machines when the temperature of exposure is under about 700° F. Between 800° F and the temperature where melting begins (the solidus, which ranges from 970 to 1050° F for most common die casting alloys), the amount of pimpling and/or distortion is related to the quantity and distribution of the trapped air.

Where die castings are to be subjected to elevated temperatures during service, pimpling tests, if any, should be conducted at, or only slightly above, the actual maximum temperature anticipated during service. Should these required temperatures exceed about 950° F the solidus of the alloy being used should be heeded since any testing temperature exceeding this value will cause all castings

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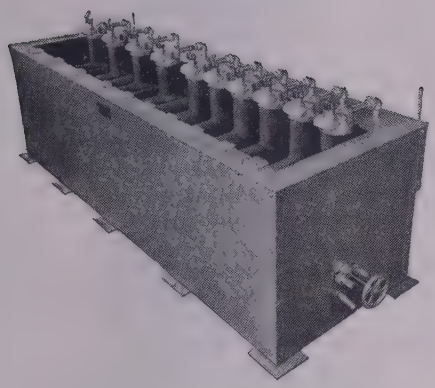


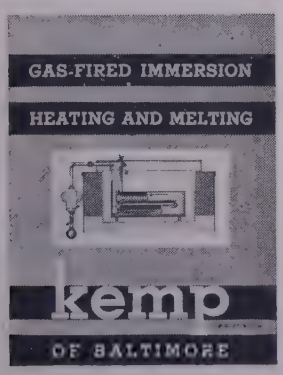
10-Burner Kemp Immersion Heating Pot, with Drain Valve for heated material change from time to time.

When you figure that out... it often happens that you find Kemp Immersion Heating equipment will pay for itself in 2 years or less.

That's the record for many users of Kemp equipment!

But first—to complete your data—you'll have to know what Kemp equipment costs. That's where the Kemp representative can help. There is one near you... a qualified engineer... and a word to us will bring him at your convenience.

Or perhaps, you'd like to see our interesting illustrated booklet on Immersion Heating for industry. Yours, too, for the asking.



The C. M. Kemp Manufacturing Co.
405 East Oliver Street
Baltimore 2, Maryland

☐ Please send me your NEW Bulletin No. IE-11 on Immersion Heating.

☐ Please send a Kemp representative in to see me.

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City..... Zone.....

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HS-9

KEMP of BALTIMORE

The C. M. KEMP Manufacturing Co.
405 East Oliver St., Baltimore 2, Md.

PRECISION CARBURETORS • BURNERS FOR INDUSTRIAL HEAT CONTROL • FIRE-CHECKS AND OTHER SAFETY DEVICES
ATMOSPHERE GENERATORS • INERT GAS PRODUCERS • ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL

to begin to melt regardless of air content.

Aluminum die castings sometimes pimple and distort upon being subjected to elevated temperatures. This is largely caused by air mechanically trapped and compressed when the casting was produced.

High Strength Piston Rings

STAINLESS steel piston rings, made by Steel or Bronze Piston Ring Corp., Indianapolis, are reported to be suitable for high temperature application such as plunger-injection type die casting machines where ring and plunger operate partially submerged in molten metal. According to the company, the first such rings made showed no signs of fatigue or collapse after four months of operation. Inasmuch as stainless steel maintains tension under excessive temperatures and is corrosion resistant, it was chosen for a new series of nonbreakable piston rings announced by the company.

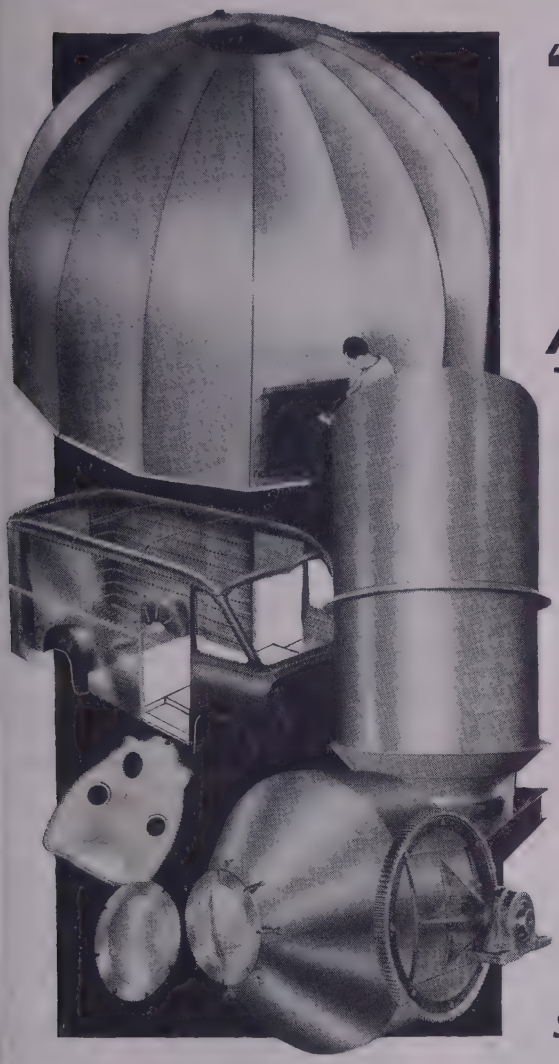
Besides being free from distortion, the rings are said to reduce friction and wear by providing a dissimilar metal for the rubbing surfaces and to increase compression efficiency by a near-constant expansion factor which permits closer tolerances between ring and cylinder wall. Rings are made by forming from open-end metal to true circle proportions and heat-treated in that shape.

All rings are ground on the outside diameter and lapped on the sides to provide better seating and eliminate "sloppiness" in the piston grooves. Lapping also permits two rings to be employed in the same ring grooves where experience indicates this produces maximum efficiency.

Powder Meeting Proceedings

PUBLISHED in the form of a 116-page illustrated booklet are the proceedings of the fifth annual meeting of the Metal Powder Association, held in Chicago in April. Included are an informal open discussion of powder metallurgy by leading powder metallurgists, metal powder producers and parts fabricators as well as seven papers on several phases of powder metallurgy.

Subjects of papers included are: Some Effects of Oxygen on the Performance of Iron Powder; Tolerances of Finished Metal Powder Parts; Hygiene in the Metal Powder Industry; Selling Parts From Metal Powders; Effects of Impurities in Metal Powders; Powder Metallurgy from the Design Engineer's Viewpoint; Chracteristics of Materials Involved in the Magnetic Fluid Clutch.



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TO EXACTING METAL WORKING SPECIFICATIONS

METAL STAMPINGS - HEAVY WELDMENTS - PRESSED STEEL SHAPES

CHARLES T. BRANDT, INC. — 1700 RIDGELY ST. — BALTIMORE 30, MD.

Copper-Base Die Alloys

(*Concluded from Page* 86)

steel deep drawings for midget washing machine tubs and is still in operation.

Die Preparation—A material possessing all the natural properties of a good die alloy may not live up to expectations if time and care are not spent in final preparation to produce a smooth, clean, polished surface. Only too often negligence in finishing and preparing the surfaces for use can reduce the life of the die as much as 50 per cent.

Although special bronzes such as the new die alloy have all the requirements of a good die material and will not score and seize even if final die preparation is not perfect, it is still recommended that particular attention be paid to surface finish for maximum die life. The alloy inherently possesses the ability of developing an extremely smooth surface when machined properly. It does not pit or tear and with the correct procedure will machine as easily as most die materials.

For best machining results on the alloy, carbide tools with soluble oil coolants using up to 250 sfpm with a 0.007-0.020-inch feed for roughing and 500-800 sfpm with 0.002-0.005-inch feed for finishing are recommended. The tool should be 1/64-inch below center line and during finishing a 0.005-inch land on the cutting edge will eliminate chatter.

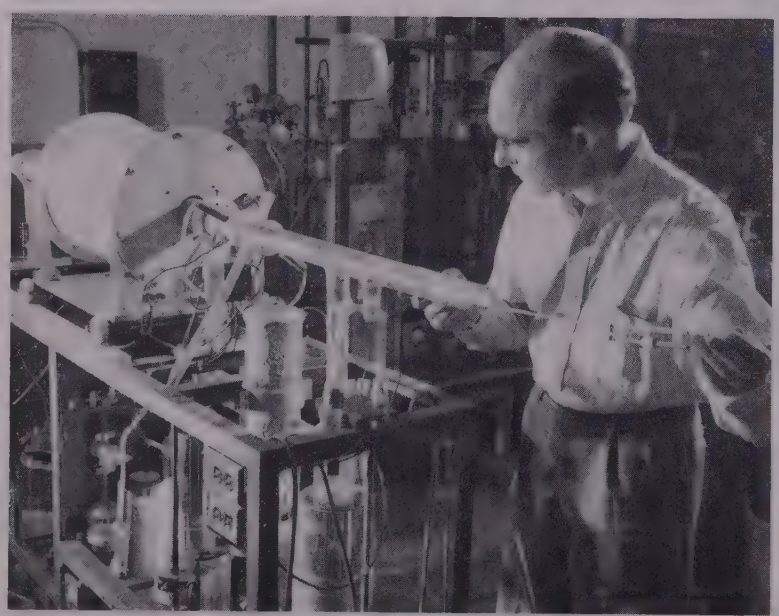
Drilling and Tapping—Perhaps the most difficult machining operations on bronze die alloys are drilling and tapping. Wherever methods of holding the die in place other than tapping can be employed these should be used. Tapping into dies is always a source of trouble. Because of the brittleness of the alloy, shock loads, mishandling, or even the drilling and tapping operations may crack the material. If drilling and tapping are imperative the following procedures should be used.

Wherever possible, a carbide tipped straight flute drill with a feed of from 0.002 to 0.007 per revolution and running from 70 to 150 sfpm should be used with proper coolants. The tap should be of the design shown in Fig. 5 using a standard or slightly oversize drill for the desired thread. All holes should be chamfered 1/16 x 45 degrees before being tapped to prevent breaking out of the edges and tapping should be done using three taps for blind holes and two taps for through holes (starting, regular and bottom taps). Hand tapping with lubricant and backing the tap off at regular intervals to clean chips gives most satisfactory results.

Grinding can be successfully employed by using silicon carbide vitrified wheels at speeds of from 5000 to 6000 sfpm. The work piece should be run at 25 to 150 rpm using soluble oil as a coolant. Polishing, an important finishing operation is done with grade 240 and 320A silicon carbide abrasive cloth. The final finish on the piece should be done with crocus cloth.

Lubricants—The type of lubricant used will depend upon the job, tool materials, tool and metal surface, and ease with which it must be removed. No single lubricant can be recommended because of these variables. Success has been realized with either extreme pressure, pigment, nonpigment, or soap type lubricants. Actually, trial will tell the best and most efficient lubricant on each particular job.

Of all die operations, deep drawing is perhaps the most common troublemaker. In deep drawing cup or box-shaped parts, the most generally recommended die parts to be made from the new alloy are the die and hold-down ring. Occasionally the punch is also made from the copper-base alloy but more often than not the nature of the draw is such that the major movement of the blank is against hold-down and draw rings. The punch serves as a guide and moving force rather than a working or bearing surface. Fig 6 shows a typical deep drawing setup for both hold-down and draw ring. The greater hold-down pressures that are possible with bronze rings help greatly in the elimination of scratching and wrinkling without danger of excessive die washing and surface marring.



CRYSTAL FURNACE: To determine why and how metals form different structures under different conditions, it is necessary to study the composition of the crystals themselves. Forming of a single, two-dimensional shaped crystal, a difficult feat necessary to accomplish the study, is possible with a furnace developed by Westinghouse Electric Corp., Pittsburgh. Starting with a very pure metallic sample, thin single crystal sheets measuring ½ x ½-inch and 10 mils thick can be formed. This is accomplished by heating a metal sample to just above its melting point in the best possible vacuum, and then cooling it very slowly and evenly

140 New Standards

INCLUDED in the midyear list of standards and special publications issued by American Standards Association, New York, are more than 140 new American standards, approved since January of this year. A total of 1124 standard specifications, methods of test, building requirements, dimensions, safety codes, definitions and terminology in all fields of engineering as well as for equipment and materials used by the ultimate consumer are listed.

Among the new standards listed for the first time are those on the photographic processing and electrical indicating instruments. Two new American standards on small tools and machine tool elements also are included.

Gas Carburizing

(*Concluded from Page* 81)

lation where the trays were oil quenched along with the work. These trays were not being fully cleaned before returning to the furnace to carry more work through the muffle, and some vapors of oil were carried into the muffle along with the trays. The result was spotty carburizing and a lot of carbon scale.

When the oil vapors were removed by proper cleaning of the trays the difficulty disappeared. Since this carbon scale formation took place in the heating zone of the muffle, and was caused by the deposition of tar in various angular depressions of the work, it became confused in the minds of some with the deposition of carbon in this same zone when using natural gas as the hydrocarbon. As a matter of fact the two things were separate and unrelated phenomena and should not be confused since the deposition of soot was a desirable thing but the deposition of tar was most undesirable. It was evident that the process would have to be modified in some way to adapt it to the use of the higher hydrocarbons with their tendency to form unsaturates and consequently tar in the early stages of heating.

(*To be concluded*)

1000 Pound Plug Valve

THOUGHT to be the largest lubricated plug valve ever manufactured is a 15,900 pound unit built and tested in the Nordstrom Valve plant of Rockwell Mfg. Co., Oakland, Calif. Twelve of these valves are being made for the initial section of Pacific Gas & Electric Co.'s 34-inch gas pipe line from the Colorado River to the San Francisco bay area.

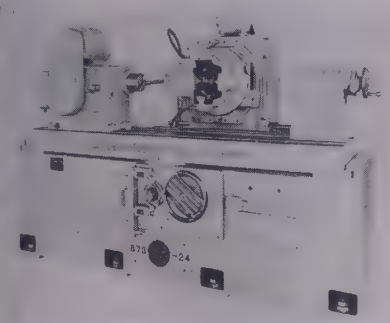
Maximum thickness of the body wall is 3 inches and that of the throat wall is 3⅛ inches. It is stated that over 1600 man-hours were required to develop the first of these valves, this including time for designing, machining and testing. Valve with the cylinder operating unit is 81½ inches high and the end-to-end dimension is 59 inches. Weight of the plug alone is 1000 pounds.

Ten of the valves will be 30 x 34 inches and will have elevated gearing. Two of the same type will have electric motor control. Valves are designed with butt-welding ends and are designed for 1000 pound wog. The cylinder is designed to operate the valve under unbalanced pressure equal to the maximum working pressure of the valve, with not more than 75 pound differential pressure across the cylinder.

New Products and Equipment

Rotary Gear Finisher

Completely automatic in operation, the model 873 crossed-axis rotary gear finisher for heavy duty gears, announced by Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich., will handle spur or helical gears and involute splines from 0 to 18 or 24 inches in diameter and up



to 15 inches in face width. Machine has ability to shave gears by the underpass, transverse or traverpass method. It will curve-shave or crown, wide faced gears as well as narrower gears.

Rapid approach speed in the machine cycle and automatic in-and-return feed are incorporated for a faster cutting. A special interchangeable cutter head is available to provide for finishing of internal gears. Machines are so designed that an overhead crane or hoist can be used to load heavy gears.

Check No. 1 on Reply Card for more Details

Splashproof Motor

Dripproof, splashproof and totally enclosed nonventilated enclosures are available for the new form BW

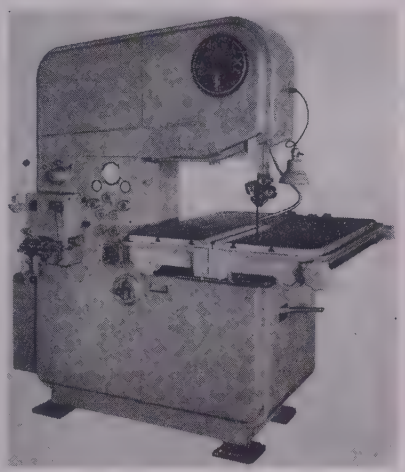
protected-type wound-rotor motor, built in NEMA frames 224-505 by Crocker-Wheeler Electric Mfg. Co., Ampere, N. J. Offered in ratings up to 100 hp, motor features include NEMA floor, sidewall and ceiling mounting assemblies and NEMA C face and D flange mountings.

Motors are designed for applications requiring smooth acceleration, high starting torque with low starting current, ability to start and stop or reverse frequently or variable speed.

Check No. 2 on Reply Card for more Details

Contouring Machine

Every solid material can be precision cut with the new semiautomatic hydraulically controlled manufacturing machine tool developed by DoAll Co., Des Plaines, Ill. Called the Contour-matic, the machine employs an endless band of teeth to slice through



material, removing it in sections in what may be a repetitive production cycle easily controlled by the operator

Machine has a 20-inch throat and will cut material up to 12 inches thick. Dial control of hydraulic power used in operating the machine gives a wide range of speed in saw band velocity from 40 to 10,000 fpm. Saw bands are available for cutting every kind of material. Variable hydraulic feeding pressure up to 100 pounds is provided. In feeding material, pressure and speed of table travel is controlled through a hydraulic control valve and pressure dial indicator that governs the hydraulic reciprocal movement of the work table through a 16-inch stroke.

Check No. 3 on Reply Card for more Details

Dip Tank, Melting Pot

Heat is uniformly transferred through thick aluminum walls to heat or melt, without charring, viscous compounds, waxes, greases, etc.. in the Electrodip melting pot and dip tank made by H. McNaughton Co., 201 Parsons St., Kalamazoo, Mich. It is thermostatically controlled and thoroughly insulted. The aluminum casting dip compartment has a large top opening and sloping walls with smooth rounded corners.

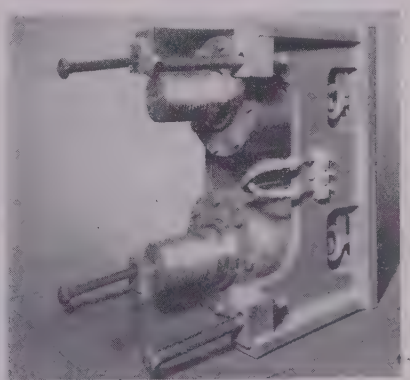
Any temperature set on the calibrated dial is held within 1° F. Casting has a large ledge to catch the overflow. A pilot light flashes on and off when up to set temperature. Closed type heating elements of

1000 w and thermostat range of 60 to 250° F or 200 to 500° F are installed for either 115 or 230 v as specified. Dip compartment tapers from 7 x 7 at the top to 5 x 5 at the bottom and is 6 inches deep.

Check No. 4 on Reply Card for more Details

End-Thrust Bearing

Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh 3, Pa., is offering an end-thrust bearing, designed to work with conventional plain radial bearings on rod or bar bills. It is available as a separately-attachable unit for easy installation on any



mill stand where one end of the rolls is open.

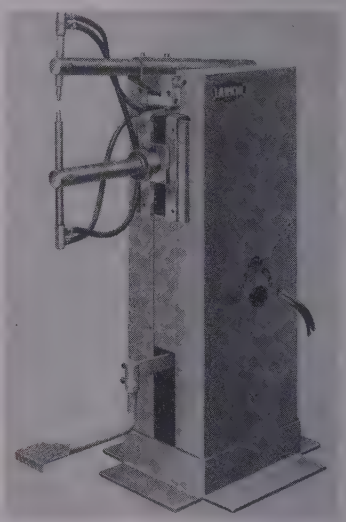
Allowing precision control over axial matching of roll passes, the bearing has the following advantages: Elimination of conventional wearing-type side thrust collars, ease and accuracy of adjustment, permanence of roll grooves location after adjust-

ment, increased life of roll grooves and guides, increased mill tonnage, better yield and more accurate tolerances. Bearing features a cartridge containing a double direction anti-friction thrust bearing mounted on a pin which fastens to and rotates with the roll. An outer casing, bolted permanently to the roll housing, encloses these roll-controlling cartridges and allows for lengthwise adjustment of each roll for its locking in position after groove matching.

Check No. 5 on Reply Card for more Details

Spot Welder

Upper horn contained in the secondary of the transformer and the secondary coming up to the top of the welder and acting as the head of the unit characterizes the light weight line of spot welders announced by Larkin Lectro Products Corp., 160 W. 146th St., New York 30, N. Y. Ranging in size from 5 to 30 kva, the



Royal welders provide identical heat per welding capacity as all other standard models. Where high speed production is required without investing in expensive equipment for timing, the welder furnishes speed through its switch manufactured with extra heavy contacts which have longer than average life.

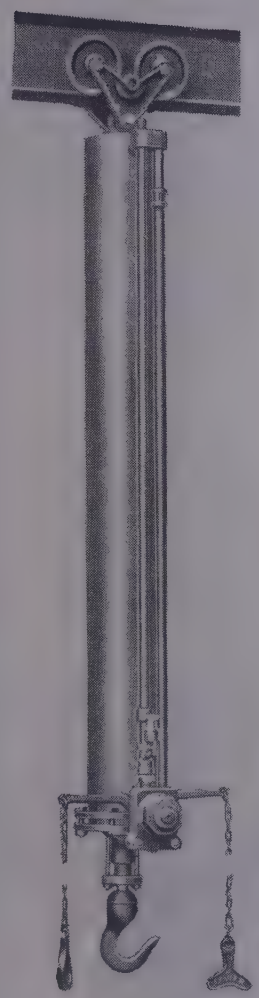
Check No. 6 on Reply Card for more Details

Mixing Machine

Dust-tight lids with rubber gaskets to prevent escape of dust are incorporated in the redesigned mixers offered by F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa. Available in 50, 100, 200 and 300 pound capacities, the mixers have safety devices on the lid which shut the motor off when the lid is raised. Variable speed control, with agitator speeds from 21-42 rpm is included

CURTIS AIR CYLINDERS

Increase Plant Efficiency—Decrease Production Costs



Curtis Air Cylinders for lifting, lowering, pushing or pulling GIVE YOU—

- Smooth, fast, accurate control of loads
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- Finger-tip control — one-man operation
- All-steel construction
- Immunity to overloads
- Low first cost, lowest operating expense
- Indoor and outdoor service

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I am interested only in items checked below:

☐ Air Hoists
☐ Air Cylinders
☐ Air Compressors

Name. . . . . .
Firm. . . . . .
Street. . . . . .
City. . . . . Zone. . . . . State. . . .

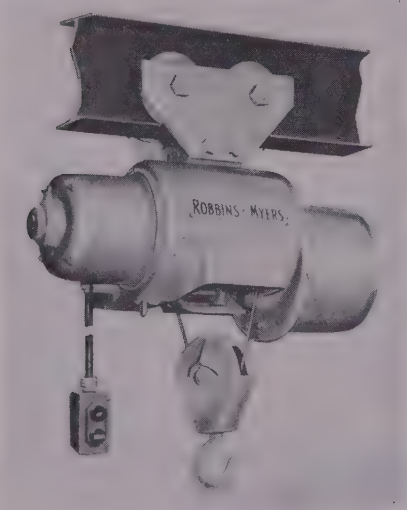
in the design. Of all welded rigid construction, the mixer design permits easy cleaning. An enclosed drive protects working parts from dust and dirt. An adjustable discharge chute may be tilted to any height. Mixer has pushbutton stop-

and-start control and a jog button for the agitator motion when dumping. A perforated trough is available to admit solutions in certain applications.

Check No. 7 on Reply Card for more Details

Wire Rope Hoist

Suitable for stationary, hook or trolley mounting in small shops, on production floors and in receiving dock and loading areas is the type J wire rope hoist, manufactured by Robbins & Myers Inc., Springfield,



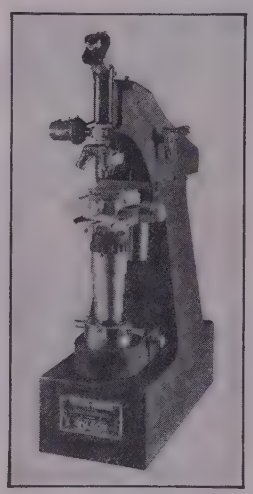
O. Available in ¼, ½ and 1-ton capacities with pendent rope or pushbutton control, the hoists are equipped with totally enclosed ball bearing motors.

Motors develop high starting torques required in hoisting service. An electrically-activated, shoe-type motor brake provides instantaneous stopping and assures accurate spotting of loads. An oversize Weston load brake with nonreversing clutch, automatically controls speed when load is lowered and prevents dropping in event of power failure. Heat-treated gearing and ball bearing, oil-bath construction prolong wear life of parts.

Check No. 8 on Reply Card for more Details

Microhardness Tester

Wilson Mechanical Instrument Co. Inc., 230 Park Ave., New York 17, N. Y. is introducing the model MO Tukon microhardness tester which is mechanically operated and for use where there is not sufficient testing to warrant a fully automatic model. Made in both floor and bench models,



it applies loads of from 1 to 1000 grams and may be used with either the knoop or 136 degree diamond pyramid indenters.

Load is applied under dash pot control, speed of which may be varied from less than 0.040-inch per minute to as fast as testing permits without impact influencing the results. Both rate of application and duration of applied load may be controlled. Feature of the machine is an arrangement for removing the load without the operator having to touch the instrument until the indenter is out of the impression.

Check No. 9 on Reply Card for more Details

Spot Welders

Completely portable and self-operating, the spot welder introduced by Greyhound A. C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y., weighs about 23 pounds and may be carried from job to job by one man. It is housed in a compact noncorrosive cast aluminum housing and is entirely self-contained. To operate, it is necessary only to plug into a 110 or 220 v line and start to weld.

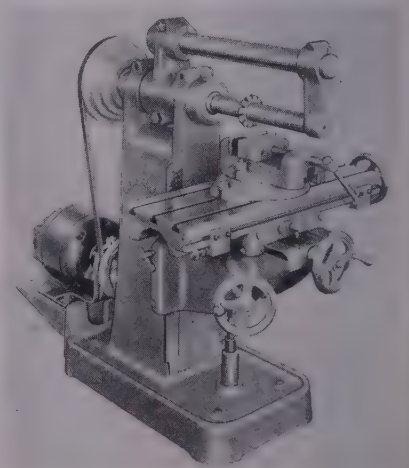
Transformer is wound with double spun-glass insulated burn-out-proof magnet wire. Core transformer is of electrical silicon steel. Removal of finger pressure from the handle automatically opens the welding tongs, thus increasing production speed and reducing the possibility of arcing and

burning of tips when not in actual use. Tool welds up to ⅛-inch combined thickness of metal, including stainless and mild steel as well as up to 2 pieces of 18 gage galvanized. Interchangeable copper arms are offered in 6, 12 and 18-inch lengths.

Check No. 10 on Reply Card for more Details

Milling Machine

Addition of a telescopic vertical screw operated by large steel miter gears has been made to the miller made by Benchmaster Mfg. Co., 2952

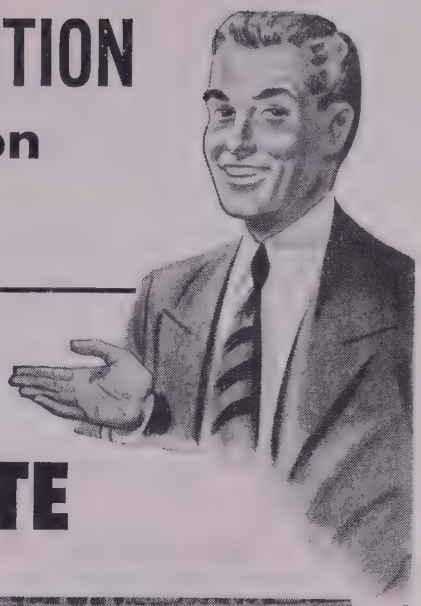


W. Pico Blvd., Los Angeles 6, Calif. Telescopic screw permits it to be used on any bench or stand without drilling the table top for the screw to extend beneath.

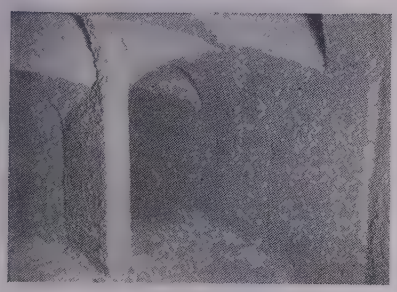
Machine, which may be used as both a horizontal or vertical mill by substituting spindle assembly, has a 6

HERE'S LOW-COST PROTECTION

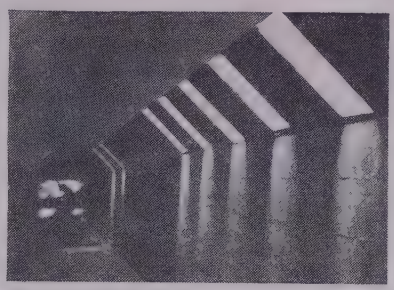
against heat and corrosion in flues or stacks



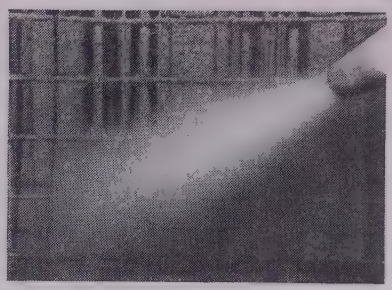
LUMNITE* REFRACTORY CONCRETE



Inside of Open Hearth Flue. There are no ragged walls or flattened arches. Notice its excellent condition after 5 years of service.



The interior of this waste-gas coke oven flue was built with Lumnite concrete. No lining was needed on this job.



Shooting Lumnite Concrete lining in steel stack. This economical Lumnite lining in stacks protects against corrosion and heat.

Flues are fully protected against heat and corrosion when Lumnite Refractory Concrete is used. Whether used as a monolithic structure or as a lining in flues, Lumnite resists high temperatures and the attacks of condensate and sulphurous gases; withstands the abrasive action of high-velocity gases and fly ash. In stacks, smooth, jointless Lumnite linings allow no breathing, boost drafts and keep gas temperatures up.

Lumnite Refractory Concrete is easily installed. It may be placed quickly in any size, shape or thickness. Stack linings of Lumnite and corrosion-resistant aggregate are trowelled in place or "shot" by concrete gun over reinforcing mesh. Maintenance costs are low. Outage time for repairs is kept to a minimum because Lumnite reaches service strength in 24 hours or less. Thus long service and easy maintenance give you many a *plus* in economical operation. For further information on Lumnite Refractory Concrete in flues and stacks, write to Lumnite Division, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

SPECIFY CASTABLES MADE WITH LUMNITE

Where suitable aggregates are not readily obtainable, tailor-made mixtures, ready for immediate use, are available. These factory-prepared mixtures of Lumnite and selected aggregates, when mixed with water on the job, may be cast into place for furnace door linings, arches, blast furnace pads, annealing furnace car tops and door linings. Special shapes can be cast in molds—ready within 24 hours. Castables made to meet specific temperature and insulation requirements are prepared by manufacturers of refractories and sold by their distributors.

**"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-19

LUMNITE® FOR REFRACTORY CONCRETE

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

x 18-inch table with a longitudinal travel of 12½ inches. Transverse feed is 5½ inches and vertical travel is 8½ inches. Timken tapered roller spindle bearings with high load capacity make the machine suitable for both low and high speed operations.

Check No. 11 on Reply Card for more Details

Car Shaker

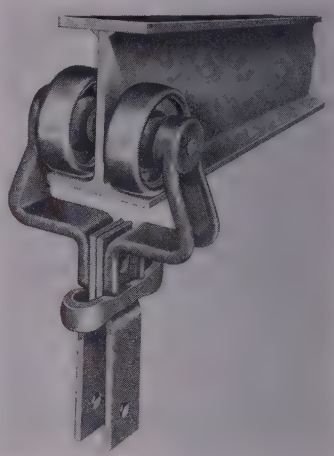
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., is building a self-contained vibrator unit, the car shaker, for the rapid unloading of bulk granular materials from open top, hopper-bottom gondola cars. Cars need not be uncoupled while the shaker is in operation. After car gates have been opened, the car shaker, which is normally suspended from a hoist, is lowered to the top of the car to begin its operation.

Rotation of its vibrator shaft at normal speed causes the vibrator end of the shaker to rise and fall, thus imparting hammer-like blows to the car, equal in number to the speed of the vibrator shaft. It is usually located at the center of the car, imparting equal vibration to both ends. The shaker weighs 9500 pounds and has power supplied by a 20 hp motor.

Check No. 12 on Reply Card for more Details

Overhead Conveyor

Need for a small overhead conveyor for light jobs is met by the Junior conveyor using 2-inch pitch chain, built by Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich. It travels on a 3-inch junior I-beam which is held by bolted brackets, these attached either to supporting angles or tierods. The entire structure is light in weight and can be hung from the average plant ceiling.



The No. 228 chain can be assembled or disassembled without tools. Drop-forged of high strength steel, it has an ultimate strength of 8800 pounds. The 2-inch pitch permits placing loads at intervals of 2 inches or more, depending upon the clearance required between the loads themselves. Trolley has brackets of drop-forged high carbon steel. Wheels have antifriction bearings. Conveyor can be arranged to tie together operations of a whole plant including several floors. Horizontal curves as short as 9 inches radius make possible close spacing of loops.

Check No. 13 on Reply Card for more Details

Fork Truck Boom

A lifting boom for handling long bulky and odd-shaped material is one of the accessories available for the model F-50 fork truck made by Buda Co., Harvey, Ill. The truck, which has a 5000 pound capacity at 20-inch load center, will reach over machinery and stored material for lifting operations, when equipped with the lifting boom.

Boom is readily interchanged with the forks and attached to the carriage in the same manner. The swivel hook may be positioned in any

one of six positions on the lifting boom for carrying various loads or used with another swivel hook, for lifting, bulky equipment.

Check No. 14 on Reply Card for more Details

Fork Lift Truck

Mercury Mfg. Co., 4140 S. Halsted St., Chicago 9, Ill., is producing a new Jeep fork truck to meet the demand for a compact, maneuverable chassis to operate on small elevators or in congested areas. Although retaining the full rated capacity of the

standard model, it has a reduced wheelbase of 33 inches. Vehicle length has been decreased so that overall length when carrying a 48-inch long pallet load is only 103 inches. It is designated as A-1364-203.

Check No. 15 on Reply Card for more Details

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TOOLS: Maxwell Co., Bedford, O., announces the modification of E-Z-Set boring-facing tools to include a new quick-reversing feature. It permits quick reversing of tool block after it has been fed out to maximum facing diameter and stopped. It is available on models No. 41 and 42.

Check No. 16 on Reply Card for more Details

CUTTERS: A new line of high speed steel core drill cutters is offered by Scully-Jones & Co., Chicago 8, Ill. It consists of 25 sizes of cutters and four holders available for use with the entire line.

Check No. 17 on Reply Card for more Details

INSULATING TAPE: Known as Type R-12 and R-20 Silastic tape, a new insulating tape especially for application by vulcanization is announced by Irvington Varnish & Insulator Co., Irvington, N. J. It consists of Fiberglas cloth impregnated and coated on both sides with Silastic rubber. On one side of tape, rubber has been completely cured and on the other only semicured. As a result when tape is applied as in-

sulation and heated for vulcanizing, a solid mass of insulation is formed, free of voids and air spaces. Tape is available in two thicknesses and five standard widths.

Check No. 18 on Reply Card for more Details

CUTOFF MACHINE: Aeroquip Corp., Jackson, Mich., announces a hose cutoff machine that cuts all types of flexible hose, even hose reinforced with plies of wire braid. It will accommodate sizes up to 3 inches in outside diameter, cutting hose at 90 degrees (square) in relation to the axis of the hose, without bothersome frayed ends.

Check No. 19 on Reply Card for more Details

SNAP GAGE: Federal Products Corp., Providence 1, R. I., offers a new all-purpose indicating snap gage with a dial indicator to warn the machine tool operator to reset the machine or tool. Designated as model 1000, the dial indicator has cushioned movement and can be faced in any position for machine or bench use. It is available in five sizes that cover all dimensions from 0 to 6 inches.

Check No. 20 on Reply Card for more Details

COATING: U. S. Stoneware Co., Akron, O., announces series K Tygon paint coating, a self-priming vinyl base paint that adheres tightly to metal, wood or concrete. It is resistant to corrosive fumes of almost all acids and alkalies. Paint may be brushed or sprayed on and may be air-dried or baked.

Check No. 21 on Reply Card for more Details

PLATFORM: Custom built corrugated all steel platforms to withstand unusual load strain are announced by Palmer-Shile Co., Detroit 27, Mich. Platforms are cold pressed from a sheet of formed corrugated heavy gage steel and can be equipped with knee braces and bumper channel runners.

Check No. 22 on Reply Card for more Details

VALVES: Featuring one piece, forged bodies which eliminate leakage, a line of improved high pressure needle valves is announced by C. A. Norgren Co., Denver, Colo. Valves have tapered point needles for closer flow control and are designed for control of air, fluids and gases under pressures up to 3000 psi. Three types are offered: Globe, angle and tee in ⅛ and ¼-inch pipe sizes.

Check No. 23 on Reply Card for more Details

VALVES: Valvair Corp., Arkon, O., announces a new line of double solenoid valves for air pressures of 0 to 125 psi. Sizes of ¼, ⅜, ½, and ¾-inch are offered in the double solenoid line. All sizes are available for 110, 220 and 440 v in both 50-60 cycle and 25 cycle current.

Check No. 24 on Reply Card for more Details

SLIDE RULE: A new 6-inch duplex type all metal log log slide rule, bearing the regular 10-inch log log scale arrangement, is announced by Pickett & Eckel Inc., Chicago 3, Ill. Designated as model 300, the rule is 1-3/32 x 6 x 3/32-inches in size.

Check No. 25 on Reply Card for more Details

CHECK VALVE: A cupola blast line check valve which will prevent accumulation of explosive gases in the blast line, blower and blower room has been developed by Norwalk Valve Co. and Whiting Corp., Harvey, Ill.

Check No. 26 on Reply Card for more Details

ROLL-TURNING TOOL: Kennametal Inc., Latrobe, Pa., has introduced a new mechanically held roll-turning tool for use in longitudinal feed lathes. Designated as style LRT, it has a solid Kennametal blade held in position on an accurate surface of supporting shank by a clamp and an advanceable backup plate. Tool is available in two sizes: 2½ x 1⅞ x 15 inches and 2½ inches square by 15 inches long.

Check No. 27 on Reply Card for more Details

ARBOR SUPPORT: Designed to fit practically all makes and models of milling machines with a round overarm, a new adjustable auxiliary arbor support is announced by Federal Machine Tool Co., Bristol, Conn. Device permits machine to be operated faster while cut can be deeper and prevents arbor from springing.

Check No. 28 on Reply Card for more Details

PLATING RECTIFIER: Model N30VP rectifier, introduced by Electronic Rectifier Co. Inc., Rochester, N. Y., provides continuous variable voltage from 0 to 8 v by a powerstat variable voltage transformer. Unit is self-contained and provides a source of direct current power for small shops or may serve as an auxiliary power supply.

Check No. 29 on Reply Card for more Details

WELD ENERGY COMPARATOR: A new weld energy comparator which gives a visual or audible, or visual and audible signal is announced by Westinghouse Electric Corp., Pittsburgh 30, Pa. Unit can be interlocked for the welding machine to lock out further welding in case weld energy is not within preset limits. It is designed to check weld energy consistency on applications where high quality welds are a must.

Check No. 30 on Reply Card for more Details

GROUND CONTACT: For greater flexibility and less operator fatigue, Luma Electric Equipment Co., Toledo 1, O., has developed a new magnetic ground contact for use with their electric marking tools. Type SC-GA is for the company's combination and standard Etchtools and type M-GA for the Master Etchtools.

Check No. 31 on Reply Card for more Details

CONTROLLER: For medium and high temperature control applications, Loudon Instruments Inc., Chicago, Ill., offers an electronic pyrometer controller. Thermocouple sensitive element is used; measuring circuit is a null balance potentiometer with automatic cold junction compensation. Thirteen standard measuring ranges are available.

Check No. 32 on Reply Card for more Details

FLOW METER: Featuring a magnetic clutch to transmit the movement of the float, a new flow meter is offered by Hays Corp., Michigan City, Ind. Hays-Penn Magna-Clutch has five adjustable range tubes giving a range from 17 to 750 inches water differential; working pressure is 1500 to 2500 psi. Six types or combinations of recording, indicating and integrating motors are available.

Check No. 33 on Reply Card for more Details

WATER PUMP: Model RD-7250-A industrial water pump announced by Lear Inc., Elyria, O., is a high pressure, electrically operated assembly. Pump end may be disassembled and cleaned by removing four through-type screws. No lubrication is required. Motor is 115 v, 60 cycles, 1/6 hp, driving pump directly at 1725 rpm. Rated capacity of pump is 50 psi.

Check No. 34 on Reply Card for more Details

TUBE FITTINGS: A complete line of Triple-lok tube fittings comprising 477 shapes and sizes is now available from Parker Appliance Co., Cleveland 12, O. Triple-lok is a three-piece flared fitting incorporating a sleeve which acts as a lockwasher, damps vibration and prevents wiping of flare during makeups. Sizes range from No. 2 (⅛-inch tube OD, ⅛-inch pipe thread) to No. 32 (2-inch tube OD and pipe thread).

Check No. 35 on Reply Card for more Details

Market Summary

DEMAND FOR STEEL is leveling off at the higher plane attained in recent weeks. Protective covering against a steelworkers' strike threat is no longer a market factor, and with the critical period so near many buyers are inclined to coast a bit pending developments. Steel sales offices, however, continue optimistic and at the moment expect the demand to remain fairly constant at the new plateau, unless interrupted by labor strife.

Considerable speculation exists, nevertheless, as to effects of the ultimate settlement of the current controversy between labor and management in the steel industry. Some observers foresee an early settlement bringing a drop in demand. They reason that consumers will start to cut down inventories built up as protection against a strike and that with continued steel production there will be no urge to buy tonnage until it is needed. Other observers believe that clarification of the outlook will contribute optimism and strength to the steel market.

PRODUCTION— Responding to the higher level of demand, production of steel for ingots and castings rose 1½ points last week to 86 per cent of capacity. This marked the sixth consecutive week of rise and put the rate at the highest level since the week ended June 18.

OUTLOOK— Main effect of the Labor Day weekend in the steel industry will be a cessation of rolling mill activity. In most cases, melt shops are scheduled to continue without interruption. Evidence that some of the recent upturn in steel production is due to protective covering against a steelworkers' strike is the closing down of some of Republic Steel Corp.'s alloy steel production facilities which had been put into temporary use. In the last week the company has taken off three alloy-producing electric furnaces and one open hearth at Canton, O., and one open hearth at Massillon, O.

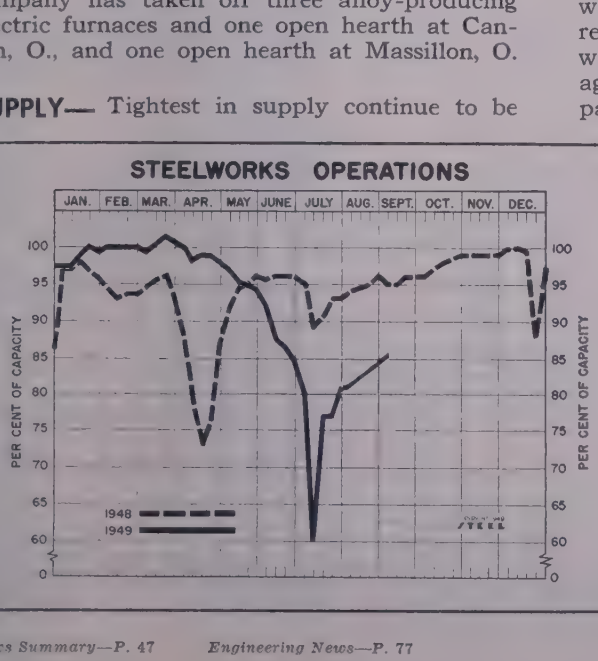
SUPPLY— Tightest in supply continue to be galvanized sheets, cold-rolled carbon sheets, and pipe. Recent strengthening in overall demand has extended deliveries on some other steel products, and the net effect has been to make some producers increasingly selective in accepting new orders. One company reported that while it has not returned to formal rationing of tonnage it has resorted to a district allotment system. Among products in stronger demand are hot-rolled carbon sheets, plates, hot-rolled carbon bars, and manufacturers wire. Demand for structural shapes continues to lag, most of the interest being confined to public projects.

PIG IRON— Demand for merchant pig iron showed further strength last week and it was necessary to restore additional blast furnaces to activity to fill requirements. The upturn in ordering is attributed to improved foundry business, protective buying against a steelworkers' strike, and the use of more iron in melts since the other principal ingredient, scrap, has risen in price.

SCRAP— Further strengthening of scrap prices occurred last week, largely on the basis of brokers' offering and activity to cover on old orders. Steel mills continue reluctant to buy at current offering prices. Reflecting a belief prices may become even higher, some dealers are refusing to sell material on hand. As result of the stronger price tone, STEEL's composite price for steelmaking scrap showed the fourth consecutive weekly increase last week and registered $23.58, compared with $22.17 of the preceding week.

PRICE COMPOSITES— Other price composites remained unchanged last week. Finished steel was $91.55, compared with $95.05 in the corresponding week last year; semifinished steel was $63.22, compared with $75.75 of a year ago; and steelmaking pig iron was $45.60, compared with $44.38 in the like week of last year.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Sept. 3	Change	Same Week 1948	Same Week 1947
Pittsburgh	79	— 3*	93.5	98.5
Chicago	91	— 1.5*	94	90.5
Eastern Pa.	80	+ 3	92	92
Youngstown	94	+ 4	103	92
Wheeling	96	+ 2	92.5	81.5
Cleveland	100.5	+ 4*	91.5	91
Buffalo	101	+ 2.5	101.5	94
Birmingham	100	None	100	99
New England	77	+ 7	80	80
Cincinnati	97	+ 4	99	87
St. Louis	87	None	85	82
Detroit	103	+ 7	99	92
Western	85	+ 2	..	..
Estimated national rate	86	+ 1.5	95	93

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * From revised rate.

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COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Sept. 3	Aug. 27	Month Ago Aug. 1949	Year Ago Sept. 1948	5 Years Ago Sept. 1944
Finished Steel	$91.55	$91.55	$91.62	$95.05	$56.73
Semifinished Steel	63.22	63.22	62.67	75.75	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	44.62	23.00
Steelmaking Scrap	23.58	22.17	20.86	43.33	18.00

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Sept. 3, 1949	Aug., 1949	June, 1949	Sept., 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.45c
Steel bars, del. Philadelphia	3.83	3.8164	3.8164	3.79
Steel bars, Chicago mills	3.35	3.35	3.35	3.35
Shapes, Pittsburgh mills	3.25	3.25	3.25	3.275
Shapes, Chicago mills	3.25	3.25	3.25	3.25
Shapes, del. Philadelphia	3.50	3.4918	3.4918	3.48
Plates, Pittsburgh mills	3.40	3.40	3.40	3.50
Plates, Chicago mills	3.40	3.40	3.40	3.40
Plates, del. Philadelphia	3.59	3.5848	3.5848	3.71
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.40
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	3.25
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.40
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Strip, cold-rolled, Pittsburgh mills	4.00	4.00	4.375	4.375
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	4.325
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.775
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.80

Semifinished

Sheet bars, mill	$60.00	$59.25	$67.00*	$67.00*
Slabs, Chicago	52.00	52.00	52.00	52.00
Rerolling billets, Pittsburgh	52.00	52.00	52.00	59.00
Wire rod 7/32 to ¼-inch, Pitts. dist.	3.40c	3.40c	3.40c	3.775c

† 1.50 lb coating.
* Nominal.

Pig Iron

	Sept. 3, 1949	Aug., 1949	June, 1949	Sept., 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.19	$48.08	$48.08	$48.08
Basic, Valley	46.00	46.00	46.00	43.00
Basic eastern, del. Philadelphia	49.44	49.39	49.39	47.77
No. 2 fdry., del. Pgh. (N.&S. sides)	47.69	47.58	47.58	47.58
No. 2 fdry., del. Philadelphia	49.94	49.89	49.89	48.27
No. 2 foundry, Chicago	46.50	46.50	46.25	43.25
No. 2 foundry, Valley	46.50	46.50	46.50	43.50
Southern No. 2 Birmingham	39.38	39.38	39.38	43.38
Southern No. 2 del. Cincinnati	45.43	45.43	45.43	49.09
Malleable, Valley	46.50	46.50	46.50	43.50
Malleable, Chicago	46.50	46.50	46.50	43.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	62.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	175.00	148.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$24.75	$22.13	$22.60	$42.75
Heavy melt. steel, No. 2, E. Pa.	20.00	17.69	17.75	41.50
Heavy melt. steel, No. 1, Chicago	24.50	21.50	20.70	41.75
Heavy melt. steel, No. 1, Valley	25.25	21.88	21.30	42.75
Heavy melt. steel, No. 1, Cleveland	21.75	17.88	17.80	42.25
Heavy melt. steel, No. 1, Buffalo	26.25	23.38	20.35	48.15
Rails for rerolling, Chicago	37.50	32.81	27.75	64.50
No. 1 cast, Chicago	40.50	36.50	27.50	71.10

Coke

Connellsville, beehive furnace	$13.25	$13.25	$13.70	$14.50
Connellsville, beehive foundry	15.75	15.75	16.15	17.00
Chicago, oven foundry, ovens	20.00	20.00	20.24	20.40

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: $60 per gross ton, Mansfield, O.; $52 on open market.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & 5/16-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.20c, Torrance, Calif. Basic open hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.10c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., Moline, Ill., Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.25c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Los Angeles, Pittsburg, Torrance, Calif. 4.10c, Seattle, S. San Francisco, 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa., Kokomo, Ind.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.00c, Dover, O.; 5.05c, Torrance, Calif.; 4.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill except: 4.50c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.; 5.40c, Dover, O.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill.

Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.

Dynamo: 7.50, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill; 58, 9.30c, mill; 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Detroit, Ecorse, Mich.; 3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Los Angeles, S. San Francisco, Pittsburg, Torrance, Calif.; 4.25c, Seattle; 4.30c, Minnequa, Colo.; 4.10c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip: (0.25 carbon and less): 4.00c, mill, except: 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif.; 5.75c, Los Angeles; 6.10c, Berea, O. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn.

Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston.

Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton and Harrison, N. J.

Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J.

Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb. 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, Mo., Los Angeles, Torrance, Calif.; 3.90c, Seattle; 3.75c, Minnequa, Colo.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Palmer, Mass.; 4.50c, Minnequa, Colo., Atlanta; 4.75c, Kansas City, Mo.; 5.10c, Pittsburg, Calif.; 5.10c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.30c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Los Angeles, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md.; 5.50c Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Los Angeles, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Los Angeles, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 4.95c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago and Houston.

Galvanized (6 to 8 Gage base): 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.40c, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 122, Pittsburg, Calif.; 123, Torrance, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 106, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 112, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 143 S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base; another, Col. 126, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Fence Posts (with clamps): Col. 112, Duluth, Joliet, Ill.; Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 109, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago and Houston.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50	30.50	37.50
302	28.50	33.00	37.50
303	31.00	36.50	39.50
304	30.00	35.00	39.50
316	46.00	55.00	53.00
321	34.00	44.50	45.50
347	38.50	48.50	50.00

STRAIGHT CHROMIUM STEELS

410	23.00	27.00	33.00
416	23.50	33.50	33.50
420	28.50	43.50	40.50
430	23.50	27.50	35.50
442	27.00	39.00	39.50
446	32.50	60.00	50.00

STAINLESS-CLAD STEELS

	Plates —Cladding—		Sheets —Cladding—	
	10%	20%	10%	20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ¾ x 6 in. and shorter	37 off
⅞-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	41 off	....
1/2-in. and smaller	....	38 off
½-in.-1-in.	39 off	....
⅝-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
¾, ⅞, & 1 x 6-in. and shorter	35 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
7/16-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

Butt Weld

In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½–	11–	1	46½–	30½–
	41½	13½		48½	33½
¼	37½–	13–	1¼	47–	31–
	39½	15½		49	34
⅜	34–	9½–	1½	47½–	31½–
	36	12½		49½	34½
½	41–	23½–	2	48–	32–
	43	26½		50	35
¾	44–	27½–	2½, 3	48½–	32½–
	46	30½		50½	35½
			3½ & 4	44½	29

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	40½	25	38½	23	28–	12½–
					38½	23
2½	44½	29	41½	26	33½–	18–
					41½	26
3	44½	29	41½	26	36–	20½
					41½	26
3½&4	42½–	26–	43½	28	38½–	23–
	46½	31			43½	28
5 & 6	42½–	26–	43½	28	43½	28
	44½	29				
7	....	....	....	....	43½	27

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

For prices on line and standard wrought iron pipe and boiler tubes, please refer to Aug. 8 issue, page 123.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.63	51.13	51.63	52.13
Brooklyn, N. Y., del.	....	52.79	53.29	..
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.50	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, del.	....	51.98	51.98	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.39	48.89	48.89	49.39
Duluth, furnace	....	....	46.50	....
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	46.00	46.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Lorain, O., furnace	46.00	....	....	47.00
Minnequa, Colo., furnace	47.00	47.50	47.50	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.19	47.69	47.69	48.19
Pittsburgh (Carnegie), furnaces	46.00	....	46.50	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Steubenville, O., furnace	46.00	....	....	47.00
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.26	50.76	50.76	51.26

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.95 for McKees Rocks, Pa.; $1.44 Lawrenceville, Homestead, McKeesport, Monaca; $1.90 Verona; $2.13 Brackenridge; $1.19 for Ambridge and Aliquippa.
§ Includes Chicago, S. Chicago, Ill., Gary, Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $71.50 furnace, Niagara Falls; $77 open-hearth and foundry grades, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area; 12½ lb piglets, $82, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.045% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn.....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $57.09 del. Intermediate phosphorus, Central Furnaces, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb. f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
6	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens, New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.91
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.32
Cincinnati, del.	22.77
Detroit del.	23.75
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.02
Cleveland, del.	22.62
Erie, del.	21.04
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens.	20.40
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens
(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective June 1, 1949)	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do., tank cars	12.50
(Effective Oct. 25, 1948)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.
High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.
Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.
Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.
Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot:	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[5]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.60	6.80	7.75	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.45	6.65	7.60	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[3]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma .	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%), Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(Please turn to Page 164)

Stockpiling Funds To Be Cut

Reduction of $275 million voted by the Senate and now being considered in conference with the House will result in smaller purchases of strategic metals. Prices hold steady

New York—Senate has voted a reduction of $275 million in funds for stockpiling in the fiscal year 1950. The reduction is proposed in contract authority and will be considered in conference with the House. Total appropriations previously approved by Congress and the White House amounted to $835 million. Although the reduction in stockpiling funds will have an important bearing on purchases of strategic nonferrous metals, this program will continue to be an important market factor throughout the fical year.

The Senate, in another action, turned down S. 2105, the O'Mahoney bill which would provide government assistance for the exploration and conservation of strategic and critical ores, minerals and metals.

Basic tin conservation order M-43 has been revised drastically, permitting relatively free import of tin by private business, while conservation order M-81 has been revoked, effective Dec. 1, 1949. For additional details, see p. 56.

Copper — Fair tonnages of electrolytic copper are being booked in both the domestic and export markets at 17.62½c. Consumers here are more reluctant to place orders for October and beyond pending outcome of the present steel labor controversy. Should this problem be solved without slowing down the present rate of industrial activity, copper and brass mills are expected to enter the market for substantial fourth quarter requirements. Undertone of the primary copper market has been strengthened indirectly by the advance in red metal scrap prices to the basis of 14.50c for No. 1 copper wire.

A. E. Petermann, vice president, Calumet & Hecla Consolidated Copper Co., says the company will resume operations at its Houghton, Mich., properties around Sept. 6 following a four-month shutdown. Wages will be 15 cents an hour lower than before the shutdown.

Lead—Production of lead is being curtailed further by labor and other difficulties. R. R. Bradford, general manager of the Utah Department, American Smelting & Refining Co., announces the company is closing down the Murray, Utah, lead smelter on Oct. 1 due to shortages of ore and "other economic" conditions. The company will continue to handle inquiry of shippers and miners from its Salt Lake office and to operate other western smelters. Several lead producing properties in the west operated by various companies are still closed by strikes.

Only a fair volume of business is being transacted on the unchanged price basis of 14.92½c, St. Louis. This is attributed mainly to seasonal factors, with a pickup expected following the Labor Day holiday.

Zinc—Zinc prices remain steady on the basis of 10.00c, East St. Louis, for prime western, although the market is supported by only a moderate volume of new business. Most consumers, especially galvanizers, are marking time pending outcome of the steel wage controversy. A pickup in buying is also delayed by the usual influences of the Labor Day holiday.

Tin—Trading in tin for future shipments came to practically a standstill last Tuesday following announcethat the British Ministry of Supply, which buys and sells all of the Malayan and most of the Nigerian tin production, has retired as a seller. Just prior to the cessation of trading, some Straits tin sold at from 99.00c to 98.00c for expected arrival here from late October to December. Meanwhile, the domestic market continues firm on the basis of $1.03, New York.

STEEL's Metal Price Averages for August, 1949

(Cents per pound)

Electrolytic Copper, del. Conn.	17.625
Lead, St. Louis	14.806
Prime, Western Zinc, E. St. Louis	10.000
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	17.000
Antimony, f.o.b. Laredo, Tex.	38.500
Nickel, f.o.b. refinery	40.000
Silver, New York	71.889

Castings Shipments in June

Washington—Shipments of copper and copper-base alloy castings during June totaled 52.6 million pounds, only slightly under the 53.3 million pounds shipped in May, but 38 per cent under the 84.8 million pounds shipped in June 1948.

The decrease in June shipments is accounted for by a 10 per cent drop in shipments of permanent mold castings to 2.5 million pounds, and a 22 per cent drop in "all other" copper castings to 1.6 million pounds. Sand castings, which accounted for almost 91 per cent of all copper castings shipped in June, amounted to 47.7 million pounds, about equal to May shipments. Die castings shipped in June amounted to 793,000 pounds compared to 824,000 pounds in May.

Shipments of copper castings for sale to the trade during June totaled 26.4 million pounds, slightly above the 26.2 million pounds shipped for the producing companies' own use. At the end of June, the volume of unfilled orders for commercial castings amounted to 26.8 million pounds, a drop of 13 per cent from those of May 31, and about equal to one month's activity at the current rate of shipments.

Aluminum Castings—June shipments of aluminum and aluminum-base alloy castings totaled 23.3 million pounds, 9 per cent above the 21.4 million pounds shipped in May but 35 per cent below the 35.8 million pounds shipped in June 1948.

Shipments of sand castings during June totaled 8.7 million pounds, 14 per cent above the May shipments of 7.6 million pounds. Permanent mold castings shipped in June totaled 7.8 million pounds, compared with 7.3 million pounds shipped in May. Shipments of die castings increased to 6.3 million pounds from 6 million pounds in May and "all other" aluminum castings rose to 546,000 pounds from 523,000 pounds in May.

June shipments of commercial aluminum castings, totaling 17.4 million pounds, amounted to 75 per cent of the total. The remaining 5.8 million pounds were produced for the manufacturers' own use. The backlog of orders for commercial aluminum castings at the end of June was 38 million pounds or about 2 months' activity at the current rate of shipments.

Zinc Castings—Shipments of zinc and zinc-base alloy castings totaled 32.8 million pounds in June, 22 per cent higher than the 27 million pounds shipped during May. Commercial castings shipments amounted to 18 million pounds, 55 per cent of the total shipments for June. The backlog of orders for commercial castings represents about 2 months' activity at the current rate of shipments.

Lead Die Castings—June shipments of lead die castings amounted to 606,000 pounds, 27 per cent above the 476,000 pounds shipped during May but only 51 per cent of the 1183 thousand pounds shipped in June, 1948. Seventy-four per cent of the June shipments, or 448,000 pounds, were for the producing companies' own use. At the end of June, unfilled orders totaled 248,000 pounds.

To Build Aluminum Foundry

Yellow Springs, O.—Morris Bean & Co., this city, has awarded a contract for the construction of a new 60,300 square foot aluminum foundry, to H. K. Ferguson Co., Cleveland, industrial engineer and builder.

Southwest Leads in Minerals Use

Los Angeles—Southwestern United States lead the world in the variety and quantity of iron-metallic minerals consumed for industrial purposes. In the Los Angeles area alone, mining firms spend $50 million annually for machinery and supplies. This is disclosed in *"Minerals of the Southwest"*, a catalogue published by the Los Angeles Chamber of Commerce.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.00-16.50c; 88-10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 21.00c; No. 1 yellow (No. 405) 12.75-14.25c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.92½c; chemical 15.02½c; corroding 15.02½c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25c; grade 2, 16.25c; grade 3, 15.25c; grade 4, 14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.00c per ounce.

Platinum: $69-$72 per ounce.
Palladium. $24 per troy ounce.
Iridium: $100-$110 per troy ounce.
Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12.24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $20.12½ per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $20.12½ per cwt. Traps and Bends: List price plus 55%.

ZINC

Sheets, 14.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.00c; over 12-in., 14.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. Avg.	17.625	14.806	10.000	103.00	17.000	38.500	40.000	71.889
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
Aug. 1	17.62½	14.30–14.35	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 2-6	17.62½	14.55–14.60	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 8-10	17.62½	14.80–14.97½	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 11-17	17.62½	14.80	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 18-22	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 23	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	72.00
Aug. 24	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	72.50
Aug. 25-31	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	73.00
Sept. 1	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	73.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleviand, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red Brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00; No. 2 copper 13.00; light copper 12.00; composition red brass 11.25-11.50; radiators 9.25; heavy yellow brass 8.50-8.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.50; No. 2 copper 13.50; light copper 12.50; refinery brass (60% copper) per dry copper content 12.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.50-12.75, No. 2 11.50-11.75, light copper 10.50-10.75, No. 1 composition red brass 9.25-9.50, No. 1 composition turnings 8.75-9.00, mixed brass turnings 5.50-5.75, new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.50-7.75, light brass 5.50-5.75, heavy yellow brass 6.00-6.25, new brass rods ends 7.50-7.75, auto radiators, unsweated 7.50-7.75, cocks and faucets, 7.25-7.50, brass pipe 7.75-8.00.

Lead: Heavy 11.25-11.75, battery plates 6.50-6.75, linotype and stereotype 11.75-12.00, electrotype 10.50-11.00, mixed babbitt 11-75-12.00, solder joints, 14.50-15.00.

Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 6.75-7.00, crankcase 6.75-7.00, borings and turnings 3.00-3.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$24.50-25.00
No. 2 Heavy Melt.	22.00-22.50
No. 1 Busheling	24.50-25.00
No. 1 Bundles	24.50-25.00
No. 2 Bundles	19.50-20.50*
No. 3 Bundles	18.50-19.50*
Heavy Turnings	21.00-22.00*
Machine Shop Turnings	16.00-17.00
Mixed Borings, Turnings	16.00-17.00
Short Shovel Turnings	19.00-20.00
Cast Iron oBrings	18.00-19.00
Low Phos. Steel	26.50-27.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00
No. 1 Machinery Cast	36.00-37.00
Charging Box Cast	29.00-29.50
Heavy Breakable Cast	26.50-27.00
Brake Shoes	29.50-30.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.50-25.00**
Axles	27.50-28.50
Rails, Random Length	26.50-27.50
Rails, 2 ft and under	32.00-33.00
Rails, 18 in. and under	33.00-34.00
Railroad Specialties	26.50-27.50
Angles, Splice Bars	26.00-27.00

*Nominal.
**Brokers purchase prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$21.50-22.00†
No. 2 Heavy Melt. Steel	20.50-21.00†
No. 1 Busheling	21.50-22.00†
No. 1 Bundles	21.50-22.00†
No. 2 Bundles	18.00†
Machine Shop Turnings	14.00†
Mixed Borings, Turnings	16.50-17.00†
Short Shovel Turnings	16.50-17.00†
Cast Iron Borings	16.50-17.00†
Bar Crops and Plate	23.00†
Punchings & Plate Scrap	23.00†
Cut Structurals	24.00†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	36.00-38.00
Charging Box Cast	31.00-33.00
Stove Plate	32.00-34.00
Heavy Breakable Cast	29.00-31.00
Unstripped Motor Blocks	27.50-29.50
Malleable	31.00-33.00
Brake Shoes	28.00-30.00
Clean Auto Cast	39.00-41.00
No. 1 Wheels	32.00-34.00
Burnt Cast	29.00-31.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00-25.00
R.R. Malleable	32.00-33.00
Rail, 3 ft and under	36.00-37.00
Rails, Random Lengths	30.00-31.00
Cast Steel	25.00-26.00
Railroad Specialties	29.00-30.00
Uncut Tires	28.50-29.00
Angles, Splice Bars	32.00-33.00

VALLEY

No. 1 Heavy Melt. Steel	$25.00-25.50
No. 2 Heavy Melt. Steel	22.50-23.00
No. 1 Bundles	25.00-25.50
No. 2 Bundles	20.50-21.00
Machine Shop Turnings	16.00-16.50
Short Shovel Turnings	18.50-19.00
Cast Iron Borings	18.50-19.00
Low Phos.	26.50-27.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00-25.00

CINCINNATI

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1 Bundles	18.00
No. 2 Bundles	16.00
Machine Shop Turnings	9.00
Mixed Borings, Turnings	9.00
Short Shovel Turnings	10.00
Cast Iron Borings	10.00

Cast Iron Grades

No. 1 Cupola Cast	36.50
Charging Box Cast	26.00
Heavy Breakable Cast	25.00
Stove Plate	21.00
Unstripped Motor Blocks	18.00
Brake Shoes	19.00
Clean Auto Cast	36.50
Drop Broken Cast	39.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00
R.R. Malleable	25.00
Rails, Rerolling	28.00
Rails, Random Lengths	28.00
Rails, 18 in. and under	36.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$18.00-19.00
No. 1 Bundles	21.00-22.00
No. 2 Bundles	18.00-19.00
No. 1 Busheling	21.00-22.00
Machine Shop Turnings	13.00-14.00
Mixed Borings, Turnings	13.00-14.00
Short Shovel Turnings	15.00-16.00
Cast Iron Borings	15.00-16.00
Punchings & Plate Scrap	21.00-22.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	$26.00-26.50
No. 2 Heavy Melt. Steel	23.50-24.00
No. 1 Bushelings	24.00-24.50
No. 1 Bundles	25.00-25.50
No. 2 Bundles	21.50-22.00
Machine Shop Turnings	16.00-16.50
Mixed Borings, Turnings	18.00-18.50
Cast Iron Borings	18.00-18.50
Short Shovelings	18.00-18.50
Low Phos.	27.50-28.00

Cast Iron Grades

No. 1 Cupola	35.00-35.50
No. 1 Machinery	36.00-36.50
Mixed Yard	33.00-33.50
Malleable	34.50-35.00

Railroad Scrap

Rails, 3 ft. and under	31.50-32.00
Scrap rails	28.50-29.00
Specialties	29.50-30.00
No. 1 car wheels	29.50-30.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$21.50
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
No. 1 Bundles	21.50
No. 2 Bundles	19.00
Machine Shop Turnings	15.50-16.00
Short Shovel Turnings	17.00-18.00
Mixed Borings, Turnings	15.50-16.00
Bar Crop and Plate	25.50
Punchings & Plate Scrap	25.50
Cut Structurals	24.50
Elec. Furnace Bundles	22.50
Heavy Turnings	21.50
No. 1 Chemical Borings	19.50-20.00

Cast Iron Grades

No. 1 Cupola Cast	30.00
No. 1 Machinery Cast	33.00
Charging Box Cast	28.00
Heavy Breakable Cast	28.00
Unstripped Motor Blocks	23.00
Clean Auto Cast	33.00
No. 1 Wheels	33.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	16.00-17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18.00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	9.00-10.00
Mixed Borings, Turnings	9.00-10.00
Short Shovel Turnings	10.00-11.00
Punchings & Plate Scrap	20.00-21.00
Cut Structurals	20.00-21.00
Elec. Furnace Bundles	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-26.00
No. 1 Machinery	28.00-29.00
Charging Box Cast	22.00-23.00
Heavy Breakable	22.00-23.00
Unstripped Motor Blocks	20.00-21.00
Malleable	27.00-28.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$14.00-14.50
No. 2 Heavy Melt. Steel	12.00-13.50
No. 1 Bundles	14.00-14.50
No. 1 Busheling	10.50-11.00
Machine Shop Turnings	6.50-7.00
Mixed Borings, Turnings	6.50-7.50
Short Shovel Turnings	7.50-8.50
Bar Crops and Plate	14.50-15.50
Punchings & Plate Scrap	14.50-15.50
Chemical Borings	10.50-11.00

Cast Iron Grade

No. 1 Cupola Cast	23.00-24.00
Mixed Cast	21.00-22.00
Heavy Breakable Cast	16.00-17.00
Stove Plate	19.00-20.00
Unstripped Motor Blocks	17.00-18.00

CHICAGO

No. 1 Heavy Melt. Steel	$24.00-25.00
No. 2 Heavy Melt. Steel	22.00-23.00
No. 1 Bundles	24.00-25.00
No. 2 Bundles	22.00-23.00
No. 3 Bundles	17.00-18.00
Machine Shop Turnings	15.00-16.00
Mixed Borings, Turnings	16.00-17.00
Short Shovel Turnings	17.00-18.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles	25.00-26.00
Heavy Turnings	21.00-22.00
Cut Structurals	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	33.00-34.00
Stove Plate	29.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.50-27.00
Malleable	32.00-33.00
Rails, Rerolling	37.00-38.00
Rails, Random Lengths	34.00-35.00
Rails, 2 ft. and under	38.00-39.00
Rails, 18 in. and under	39.00-40.00
Railroad Specialties	29.00-30.00
Angles, Splice Bars	33.00-34.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
Machine Shop Turnings	13.00-14.00
Short Shovel Turnings	13.00-14.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00
Charging Box Cast	27.00-29.00
Heavy Breakable Cast	24.00-26.00
Brake Shoes	24.00-25.00
Clean Auto Cast	36.00-38.00
Burnt Cast	24.00-26.00

Railroad Scrap

R.R. Malleable	27.00-29.00
Rails, Rerolling	33.00-35.00
Rails, Random Lengths	27.00-28.00
Rails, 3 ft. and under	31.00-33.00
Uncut Tires	22.00-24.00
Angles, Splice Bars	29.00-31.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	18.00
No. 2 Bundles	20.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	17.00
Cast Iron Borings	17.00
Bar Crops and Plate	28.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.50
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

STEELMAKING SCRAP COMPOSITE

Sept. 3	$23.58
Aug. 27	22.17
July 1949	19.21
Aug. 1948	43.33
Aug. 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
R. R. Malleable	nominal
Rails, Rerolling	30.00
Rails 3 ft. and under.	25.00-26.00
Angles and Splice Bars	29.50

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-22.00
Heavy Breakable Cast.	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	23.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	28.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

Sheets, Strip . . .

Mills may reinstate allotment distribution system on galvanized items

Sheet Prices, Page 140

Chicago—Sheet requirements are still increasing with virtually all major consuming groups participating in the buying. Most pronounced strength continues to come from the automotive industry, but demand from household appliance makers is also important. Improved conditions in the latter field is reflected in all grades, including electrical sheets in which buying curtailment was especially pronounced earlier. One local stove maker reports August as having been the first month of profitable operation this year. Steel orders have been received from locker and kitchen cabinet makers for November delivery with tonnage commitments higher than they had formerly been. One major district mill says orders in August were about double those received in July despite the bulge in buying which immediately preceded the threatened strike. Volume for the year to date, however, is moderately under the 1948 rate.

Cancellation for steel tonnage now is negligible. Grain bin construction, much of which is centered in the Midwest, is increasingly important as a steel outlet and capacity operations for many bin builders are assured for several months.

Meanwhile, tin plate requirements are mounting seasonally and the stringency in coated products is expected to tighten. Little of the improvement in buying is attributed by the strike possibility, although some purchasers undoubtedly feel that if their orders are in and the strike occurs they will be accorded prompter shipments when the dispute is settled.

Boston—Broader demand for sheets is filling November schedules for cold-finished; beyond that month on galvanized. Silicon sheet orders are best in months, while stove, small tank, refrigerator and electrical equipment builders are placing more tonnage. Stamping shops are also slightly more active. Producers of cold-rolled strip in this area are doing more slitting and, with tightening in volume of specialties, heavier low-carbon gages are more generally rerolled. This narrows margins in most cases and cold strip mills are taking orders they turned down early this year.

Florence Stove Co., Gardner, Mass., has contract for 1602 gas ranges, $107,702, from Chicago quartermaster purchasing office, Army. Navy is taking bids on 775 tons of sheets, including 590 tons galvanized, Sept. 7.

New York—Sheet inquiry continues to expand, and is reflected in particular in delivery promises for cold and galvanized sheets. Few sellers now have tonnage available in these grades for shipment before December and there is increasing disposition on the part of mills to ration fourth quarter tonnage in cold and coated sheets.

Whether this stringency will hold

throughout the last quarter remains to be seen, for, particularly with respect to cold finished sheets, there unquestionably has been protective covering because of the strike threat. If there is a peaceful adjustment, cutbacks might tend to ease the situation, or clarification of the labor outlook might have a salutary effect on buying.

One encouraging feature at present is the greater diversification of inquiry. No longer does the improvement appear to be spotty. Current buying can no longer be ascribed principally to protective action, for sheet deliveries extend well beyond the proposed strike deadline.

The situation in hot-rolled sheets is far easier than in cold-rolled and coated sheets, with some sellers still able to work in tonnage for shipment in five to six weeks. Specialties, such as electrical sheets and stainless material, can be had within about four weeks.

Philadelphia — Galvanized sheet supply continues tight, with indications that stringency in coated sheets will be even more prolonged than contemplated, as the government plans to increase its grain bin storage program. Most producers of these products are sold through November and, were they so disposed, could readily fill up schedules for the remainder of the year. Actually, some producers are rationing these products. Deliveries on hot-rolled sheets now extend well into October. On stainless and certain other specialties, deliveries range around three to four weeks.

Pittsburgh—Mill order backlogs of cold-rolled and galvanized sheets are furthest extended of all flat rolled steel products. Automotive interests continue major source for cold-rolled sheets, while government storage bin program is leading single consumer of galvanized sheets. Some producers of galvanized sheets are booked solidly into December; October scheduling is still available for cold-rolled. Galvanized sheets may be returned to mill allotment distribution basis. Tightness in galvanized sheet supply is further indicated by reported interest of some concerns in utilizing the galvanizing facilities at the old Apollo Steel Co., Apollo, Pa., recently purchased by M. N. Landay Co., Pittsburgh, from a syndicate of metalworking concerns which operated the sheet mills and galvanizing facilities under name of Phoenix-Apollo Steel Co. Critical shortage of galvanized sheets also is considered to be at least one of the factors behind sale last week of Superior Sheet Steel Division at Canton, O., of Borg-Warner Corp., Chicago, to Louis Berkman, president, Louis Berkman Co., Steubenville, O.

Output of stainless sheets and strip were adversely affected here last week due to complete shutdown of Crucible Steel Co.'s Midland, Pa., plant as result of a strike.

Cleveland—Demand for hot and cold-rolled carbon sheets is strong enough that sellers continue to be selective of orders. One mill has only a small tonnage of hot-rolled available for October, and another producer is sold out of this product for the rest of the year. Cold-rolled

carbon sheet production is booked well through the fourth quarter.

Silicon strip and sheet are in stronger demand, the result largely of a strengthening in the home appliance business. Producers find it impossible to give as quick delivery as has been requested on galvanized sheets for the grain bin program.

Cincinnati—A strong demand for sheets continues, with tightness in galvanized aggravated by the storage bin program. Ordering from district mills shows no sign of a slackening in needs of automobile manufacturers, no indication they are ready to reduce inventories built as a bulwark against a possible strike in the steel industry. Other requirements are expanding modestly. No improvement is discerned in stainless products.

St Louis—Sheet demand continues its mild rise, with November now the earliest delivery promised on any product. Two months ago they were available in 60 days. Roofing, a demand leader in this area, is sold out to the end of the year. Demand is diversified and indicates a slight general pickup in steel consumers' own order books. Stovemakers especially are perking up. Mill sales of cold-rolled, galvanized and electrical sheets are sharply up. A gage of the new pressure on sheet mills is the fact that their stocks of rejects and excess prime, usually 6000 to 8000 tons, are now down to 5000 tons. Flat steel shipments in the St. Louis area are expected to hit a record 28,000 tons in August.

Los Angeles—Sheet supplies continue to tighten, with mills falling behind on deliveries. One producer is 60 days behind the dates quoted when orders were taken. Columbia Steel Co. is booked on hot-rolled sheet virtually through the fourth quarter and is allocating galvanized and cold-rolled. While there is some protective buying, most of the current demand is to meet production needs. Automotive requirements for sheet and strip remain heavy, while the already large demand for galvanized is being swelled by the grain bin construction program and export requirements for Palestine.

San Francisco—Demand for flat-rolled products continues to improve at the mill and warehouse levels. The leading sheet producer is operating at capacity. Buying is stimulated by an increasing fear of a steel strike this autumn and the fact that most consumers worked inventories down to a low level and have been operating on a virtual hand-to-mouth basis for a considerable period. Most users are reconciled to the prospect that price cuts this fall are unlikely.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 140

Seattle—Rolling mill production is again normal with resumption of operations, Aug. 29, of Northwest Steel Rolling Mills Inc., Seattle, following an 8-week shutdown due to labor controversy. Meanwhile seasonal plant repairs were made. Rolling schedules have been badly disrupted but capacity operations are planned. Strong demand continues for small tonnages of reinforcing bars.

Steel Bars . . .

Bar Prices, Page 140

Boston—Any improvement developing on bars is confined largely to hot-rolled carbon and alloys; cold-finished orders are light with delivery ranging from stock to four weeks. Heavy forgings for electrical equipment builders account for some lift on alloys. Carbon bar inventories are still substantial in spots and buying is largely for fill-in sizes and grades.

Philadelphia—Hot-carbon bar shipments are becoming increasingly difficult to obtain under four to five weeks, although the situation in cold-drawn bars is less stringent. Some cold drawers can still ship from stock on a variety of specifications.

Pittsburgh—Improvement in merchant carbon bar demand continues despite fact mill deliveries are extended past threatened strike Sept. 15. Mills report considerable pressure to complete shipments on old orders before middle of this month. However, new orders for late September or early October delivery are well sustained, indicating customers' inventories have been reduced to more realistic levels. There is a growing tendency among customers to make steel commitments further ahead, due at least in part to clarification of future requirements through remainder of this year.

Output of hot-rolled and cold-finished alloy bars was sharply reduced here last week as result of complete shut down of production facilities at the Midland, Pa., plant of Crucible Steel Co. of America because of strike of 48 railroad trainmen to compel company to assign a fireman to assist in the operation of its new diesel electric locomotive.

Cleveland—Ordering of hot-rolled carbon bars has picked up somewhat but tonnage is still available for September delivery from mills. Orders are being placed for October and to a small extent now for November delivery.

The improvement stems largely from requirements of the agricultural implement, automotive, and construction industries. Although demand for cold-finished carbon bars continues light, cold-finishers are reported buying hot-rolled a little more heavily than they did two months ago.

Demand for small size hot-rolled carbon bars is said to be stronger than that for bigger sizes. This situation results to a great extent from the construction industry's requirements.

Some large sellers who do not feel free to absorb freight charges assert they are being hampered considerably by mill pricing. Some small sellers are reported to be continuing to absorb freight.

Chicago—While the hot-rolled bar picture varies widely between various district mills as to tightness, delivery and bookings into the future, September is well filled for all mills in the one to three-inch sizes. Spots are still open for rolling of smaller and larger sizes at some mills, however. A notable increase in inquiries from cold-drawers is reported by hot mills, and the farm implement indus-

try is providing the biggest upsurge in business for bar makers at the present time. Operations have recently been stepped up by several nearby implement makers, although one is known to have cut its work week back from 45 to 40 hours.

A midwestern road building equipment firm has received an order for 74 eight-yard scrapers from an eastern seaboard state, this order assuring the company of two months capacity output. Slight improvement is noted among forgers and order backlogs for this group are now figured at about 30 to 40 days. High steel inventories have steel men convinced that forge shops will not order additional steel in quantity before the end of October unless forging business suddenly bounds upward.

Plates . . .

Plate Prices, Page 141

Philadelphia—Contrary to the general trend, plate demand has picked up a trifle. District operating rates are now at the best level they have been all summer, both with regard to ingot production and rolling. Some plate mills are operating four and five days, against three days and even less a short time ago. Their ingot production also has been stepped up, with one nearby mill reaching the high level of several months ago, although admittedly engaged principally in some special rush work.

Despite better demand, most mills are still able to offer early deliveries by virtue of their improved operations. In some instances, shipments can still be had in two to three weeks. Current betterment in inquiry is principally for light tanks, but little pressure tank tonnage is reported.

New York—Plate sellers report a little pick-up in demand, but not sufficient to change their delivery situation very much. While one leading eastern producer for some time past has been sold ahead several weeks, due in part to its own requirements, most producers can make deliveries within two and three weeks.

Improvement is confined largely to light fuel oil tanks and heater equipment, although there is a slight gain in building requirements, particularly bridge work. Some plate makers also say that oil and gas requirements show a slight change for the better. Meanwhile, railroad requirements continue to lag, with specifications lighter than heretofore.

Boston—Miscellaneous demand for plates is slightly improved, but overall new volume going to mills is light. Shipyards are taking some tonnage, but with deliveries prompt there is little pressure. Weldment shops specify steadily against fair backlogs in some cases. Small tank shops are maintaining schedules, but with backlogs gradually declining.

Seattle—Several major projects involving plates are pending, including 14,900 tons for a caisson and other work at McNary dam, general contract placed, 900 tons for intake and outfall, same project, bids Oct. 5 and an unstated tonnage for a Standard Oil terminal improvement, Seattle, involving 22 new storage tanks.

Wire . . .

Wire Prices, Page 141

Boston—Slight improvement in wire buying covers broader range of products and generally carries prompt delivery specifications; forward orders are slack. Character of buying points to greater depletion of inventories by an increasing number of consumers and is marked by substantial gains in volume for mattress spring wire. Screw manufacturers are releasing more tonnage for prompt delivery.

Cleveland—Demand for merchant wire products has been tapering off this summer.

Woven fence and barbed wire sales are feeling effects of a seasonal decline in demand plus a reduction of farm income.

Sales of common sizes of building nails are off about 20 per cent from the June level, the decline being attributed largely to jobbers' waiting for price cuts. Meanwhile, jobbers' stocks are becoming unbalanced. With no prospects of immediate price cuts and with construction still at a high level it is expected jobbers will return soon to the market to replenish supplies. Exceptions to the reduced demand are duplex, roofing, and plasterboard nails, which still are in short supply.

Pittsburgh—Some improvement in manufacturers' wire production schedules developed throughout August, due to slight gain in order volume resulting from completion of downward inventory adjustment among growing number of customers and also to protective buying as hedge against possible industry wide steel strike. Mill deliveries are available within 3 to 4 weeks. The high alloy items, requiring more processing, are further extended in some instances. Sellers also note increased demand for wire rods indicating non-integrated wire producers have stepped-up operating schedules.

Chicago—A bright spot which previously had been dull in the wire producers' business picture now is spring wire, an unexpectedly good demand having arisen from furniture manufacturers, many of whom have been operating at depressed levels. Some of this volume, wire makers feel, is the result of inventory depletion and more normal buying is expected in the future. Automotive spring wire buying, of course, remains constant and heavy. Jobbers' stocks of most kinds of nails are now rounded out but with construction seasonally high some tightness may again develop.

Los Angeles — Demand for wire products remains extremely strong, with mills operating at capacity. Spring wire requirements have been increased by bed and spring manufacturers, and are continuing in good volume for automobile seats.

Rails, Cars . . .

Track Material Prices, Page 141

Seattle—Phillip M. Crawford, regional director, Department of Commerce Field Service, reports receipt of 14 inquiries from Japanese firms desiring to do business in the United States, items including railway equipment.

Structural Shapes . . .

Structural Shape Prices, Page 141

Boston—Except for public work, mostly bridges, fabricated structural volume being estimated is lower; standard plain material is available in four weeks with wide flanged slightly more extended. Most structural shops are operating off inventory which built up during suspensions due to labor troubles. Close to 500 tons, Maine bridges, went to a shop in that state, specifications requiring minimum of shop work. Reliance Steel Products Co., Pittsburgh, took contract for 900 tons, steel grid flooring, Massachusetts avenue bridge, Boston-Cambridge.

New York—Structural inquiries are fairly numerous, although lighter on an average than a couple of weeks or so ago. Public demand still dominates the situation. However, two of the larger awards recently were private projects—2700 tons for an addition to Mt. Sinai Hospital, and 1080 tons for an apartment, both in this city. Structural fabricators continue to compete actively, with backlogs still shrinking to some extent.

Pittsburgh—Structural fabricators report slight improvement in bookings throughout August, with bulk of inquiries continuing to represent public projects. Steel requirements for bridges, notably extension of Pennsylvania turnpike to vicinity of Philadelphia, has been most active. A number of relatively large plant expansion programs have been postponed pending clarification of economic outlook, particularly in respect to labor costs. Fabricators' order backlogs recorded little change throughout past month, with deliveries generally available within 4 to 5 weeks. City of Niagara Falls recently awarded 600 tons of plates and shapes to Pittsburgh-Des Moines Steel Co., Pittsburgh, for construction of an elevated water tank.

Philadelphia—Various projects are active, especially for public account, but structural awards are light at the moment. The great majority of jobs being figured are small. Fabricators' backlogs have declined further and these interests are having no trouble getting deliveries on standard shapes within three to four weeks.

Chicago—Seasonal gain in construction work is being felt variously by local steel fabricators with one now unable to entertain any more business due to the very heavy backlog of orders in the shop. This condition, however, is far from universal and some are known to be in the act of cleaning up the last of their order backlogs with no new business immediately in sight. It is reported that nonresidential construction increased markedly in July over June. One computation for the five-state area around Illinois figures the gain at 19 per cent.

San Francisco—Nothing has appeared so far to pull the structural market out of the doldrums. Although a number of sizable building projects are being planned for the West Coast, construction by private parties remains depressed and buying by fabricators is generally on a hand-to-mouth basis.

Tubular Goods . . .

Tubular Goods Prices, Page 141

Seattle—Cast iron pipe demand is slow. Some large buyers, including Seattle and Portland, bought heavily when supplies were scarce. Now that mills are in position to make prompt delivery, the larger purchasers desire to postpone due to lack of storage space or inability to handle shipments at this time. Vancouver, Wash. is in the market for 5130 feet 4 and 6 inch mains, alternatives invited.

San Francisco—Demand for large size pipe remains heavy, but orders for the medium sizes and for cast iron pipe remain slack. Oil field operations, although below a year ago, are running at a fairly high rate.

Charles Dreifus Co. Expands

Philadelphia—Charles Dreifus Co., 12 S. 12th St., this city, has purchased a controlling interest in the Penn-Harris Steel Co., Harrisburg, Pa., a steel warehousing concern established a few years ago by John E. Miller and Stanley Hughes, formerly with Bethlehem Steel Co., Bethlehem, Pa. Mr. Miller and Mr. Hughes will remain with Penn-Harris as operating heads.

Warehouse . . .

Warehouse Prices, Page 143

Philadelphia—On an average it appears that warehouse business last month was down from July. This is true not only with respect to the general run of major items but also specialties. Cold-finished bars have been about the slowest moving item on the entire list.

One leading jobber of diversified major products reports that August business, both from the standpoint of tonnage and prices, was off about 10 per cent. Most others also report a decline and, while hopeful of an improvement this month, are still hesitant in making firm predictions. Warehouse base prices are expected shortly to reflect higher freight rates effective Sept. 1.

Pittsburgh—Steel distributors report slight gain in shipments during August over preceding month, although total remained well below comparable 1948 month. Some of the improvement in August deliveries is attributed to protective buying, but an increase in metalworking operations in combination with completion of inventory adjustments among a growing number of customers are believed to be the major factors. Steel distributors note there has been less competition in recent weeks from resale of distress premium steel stock in hands of metalworking concerns. Warehouse interests are considering raising base prices on those bar sizes not produced in this district to reflect higher freight rates put into effect Sept. 1. Distributors also contend that 15-cent differential between city and country price does not adequately cover trucking costs. However, as yet warehouse interests have not raised this differential to 20 cents as

recently adopted in Chicago.

Cincinnati — Sales of warehouse steel continue at a higher level than in July. Building steel is in fair demand with some seasonal effect noted. Volume is trimmed by lack of sizeable orders from the coal mining industry which is buying close to imperative needs during the short work weeks. Inquiries lead to belief some improvement in tonnage may develop during the month.

Chicago—Pressure is again building up on warehouses for steel deliveries before the possible strike. This finds expression both in the volume of new orders and in the fact that purchasing men are following up on their orders more closely to assure prompt delivery. While stocks generally are regarded as ample for conduct of normal business, cold-rolled and galvanized sheets show signs of growing tighter, both now being unobtainable in several gages from some important local distributors. Warehouses maintaining branch operations elsewhere report the new freight rate increase is being absorbed.

Los Angeles — Activity of steel jobbers continues to gain, with demand steadily firming. While the rate of increase is not spectacular, it is steady enough to be encouraging to warehousemen. Jobbers are stepping up their purchases of items which are in medium to low inventory. Union Hardware & Metal Co., which handles fabricated products in addition to warehousing steel, has announced a completely revised pricing structure on hot-rolled sheets, plates, bars and shapes. On nearly every hot-rolled item, its new quantity structure in effect reduces prices. Other major warehouses have made no corresponding changes, either in method of quotation or prices.

Seattle—Jobbers report volume is heavier than in July, with fair demand for everything in stock. Prices are steady and unchanged, although offers of surplus, principally structurals, by fabricators and shops is a disturbing factor.

Alloy Steel . . .

Cleveland—Alloy steel production by Republic Steel Corp. is being cut back now that orders placed as protection against a steelworkers' strike are practically filled. The company has taken off three electric furnaces at Canton, O., leaving six of 12 electrics in operation. Also taken off over the weekend were one open hearth at Canton and one open hearth at Massillon.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 141

Pittsburgh — Producers of bolts, nuts and rivets experienced a slight improvement in new order volume throughout August, but not to the extent to warrant increased production schedules which in general are on one shift basis 3 to 4 days a week. Standard fastener items are readily available from stock. Quotations remain firm at price in effect at time of shipment.

Pig Iron . . .

Pig Iron Prices, Page 142

New York—Pig iron demand has not as yet reflected the improvement noted in most grades of steel products. The month just closed was slightly more active than July and most pig iron sellers anticipate some gain in September. The upward trend to date, however has been scarcely more than perceptible. The discouraging angle so far is the fact that there has been little improvement in casting demand.

The Bayonne, N. J., plant of American Radiator & Standard Sanitary Corp. has been reopened after having been closed since spring. The company also is reopening its plants at Baltimore and Buffalo.

Boston—Slight increase in shipments includes some hedge releases against possible steel strike, but on the whole buying is dull. Most furnaces have adjusted operations in line with reduced shipments. Most foreign iron has been melted and inventories are lower, but improvement in demand for castings is slight.

Cleveland—Pickup in demand for merchant pig iron has made it necessary for Republic Steel Corp. to put on one of its two merchant furnaces at Cleveland

Responsible for the increased demand for iron are higher scrap prices, a rise in new orders for castings, and buying as protection against a steelworkers' strike. Foundrymen are somewhat more optimistic

Philadelphia—Pig iron sellers anticipate some improvement in business this month, assuming no major labor disruptions. Betterment is expected to come largely as result of passing of the vacation season and arrival of more favorable weather conditions. Actual demand for castings is expected to be somewhat better and thus also contribute to the general improvement.

Pittsburgh—Foundry activity here remains very depressed with exception of those interests serving the radiation and enamelware industry. Steel mills are restricting buying to actual requirements and output of ingot molds for tool steel producers continues well below requirements noted this time a year ago. Three-day work week at coal mines also has further restricted casting demand for mine cars, etc; while requirements from freight car builders remain at a low ebb. Most foundries have ample pig iron stocks to sustain current low rate of operations for at least 30 days in event of an industry wide steel strike. Jones & Laughlin Steel Corp. recently blew in two blast furnaces, making 38 out of 47 units active in this district.

Buffalo—While the overall demand for merchant iron remains spotty, a number of jobbing shops note a pickup in inquiries. An improvement is noted also in releases against old orders. Sentiment is also slightly better among producers. Hanna Furnace increased the wind on one stack, boosting iron output from 50 per cent of capacity to 100 per cent. This move necessitated Donner-Hanna Coke Corp. to raise coking operations from 64 per cent to 75 per cent of capacity. Meanwhile, there are reports that Republic Steel Corp. and the Tonawanda Iron Division of American Radiator & Standard Sanitary Corp. are planning to relight idle stacks.

Cincinnati—Shipments of merchant pig iron into this district will likely be 20 per cent heavier during September than in recent months. A recent upturn in demand was attributed to exhausted inventories, and to an expanded melt. Individual orders continue small, without indication of any general stockpiling.

Chicago—On the basis of orders now in hand merchant iron sellers expect September business to register an improvement over August, which in turn was better than July. While part of the upturn has been occasioned by the ending of mass vacations some measure of it results also from the end to inventory reduction and the moderate improvement in castings demand. Foundrymen continue to buy close to immediate needs, much the same as castings purchasers are doing, the optimism generally evident in industry circles being pervaded with caution.

New freight rates on shipments interstate and within the Chicago switching district as well as intrastate shipments in some neighboring states, but not including Illinois or Wisconsin, were placed in effect Sept. 1.

Scrap . . .

Scrap Prices, Page 146

New York — Scrap brokers have advanced buying prices sharply on open-hearth grades, now offering $18.50, f.o.b. shipping point, for No. 1 heavy melting; $16-$17 for No. 2 heavy melting; $15-$16 for No. 1 busheling. They are offering $18-$18.50 for No. 1 bundles and $14-$15 for No. 2 bundles.

Some substantial buying is being done in this district by Pittsburgh mills at higher prices than recently. Meanwhile, brokers are paying higher prices in covering against old orders.

Brokers are offering $9-$10, f.o.b. shipping point, for machine shop turnings and for mixed borings and turnings; $10-$11 for short shovel turnings; $20-$21 for punchings and plate scrap, cut structurals and electric furnace bundles.

No. 1 cupola cast is higher at $25-$26; No. 1 machinery, $28-$29. Charging box and heavy breakable cast grades are $22-$23; unstripped motor blocks, nominally $20-$21; and malleable $27-$28.

Boston—Heavy melting steel scrap and turnings are higher with new buying light; stronger prices are due to covering against old orders. Current price for steel scrap at Pittsburgh and eastern Pennsylvania coupled with freight costs to those points hardly warrants prices bid in this area.

Philadelphia—While there is little consumer buying of open-hearth steel scrap, brokers are having to further increase their buying prices in covering on old orders. On the basis of what brokers must pay, the market is $21.50, delivered, on No. 1 heavy melting steel; $20 on No. 2 heavy melting and No. 1 busheling. No. 1 bundles are up to $21.50; No. 2 bundles, $19. Machine shop turnings and mixed boring turnings are higher on small consumer buying at $15.50 to $16. Short shovel turnings are unchanged at $17-$18. Bar crop and plate and punchings and plate scrap are higher at $25.50; cut structurals, $24.50; electric furnace bundles, $22.50. Heavy turnings are higher at $21.50; No. 1 chemical borings, $19.50-$20.

Prices on cast grades continue strong with consumer orders at $30, delivered, for No. 1 cupola cast; $33 for No. 1 machinery. Charging box and heavy breakable cast grades are higher at $28; unstripped motor blocks at $23. Clean auto cast and No. 1 cast wheels are stronger at $33.

Buffalo—Prices are $2 a ton higher on steelmaking grades of scrap and $5 a ton higher on cast material, the latter substantiated on sales. Steelmaking grades moved up as dealers refuse to sell below the advanced levels. In addition, sales were reported to local consumers by outside sources at the prevailing advanced ranges. No. 2 heavy melting jumped to a range $24-$24.50 when one dealer reported turning down an Ohio bid of $25, f.o.b. Buffalo. Michigan and New England scrap also is moving into the area at increased prices, despite the refusal of mills to do business locally at the advanced figures. Cast moved up with No. 1 cupola quoted at $35-$35.50.

Detroit—Soaring scrap prices of the past 30 days, finding most grades higher by $7 to $10 a ton, continue to be explained as short covering by brokers and suggest there has been a lot of "kidding" going on in the past month by somebody. Reports have been that mills were remaining steadfastly out of the market, even at the low prices prevailing early in August. However, it now appears there must have been a considerable amount of quiet buying by many mills, the idea apparently being to convince brokers they were being given special favors. At the time brokers said nothing, but when they started to go out and cover these orders they found most of their competitors in the same boat and prices started to skyrocket.

Some brokers admit they are literally losing their shirts in the covering process, being forced to take losses of $5 a ton and upward. Even the present advanced level of published prices does not reflect the true situation, since spirited bidding on industrial scrap lists, including substantial automotive tonnages, is driving quotations up in daily spurts.

No. 1 bundles are quoted here $21-$22 but it is doubtful if any broker could buy at less than $2 beyond this level.

Cleveland—A stronger tone prevails in the scrap market here, although there is little buying. Brokers are asking higher prices than mills

are willing to pay. Contributing to mills' reluctance to buy is the steelworkers' strike threat which casts considerable uncertainty over near-term operations. Some dealers are showing an increased reluctance to sell and are holding tonnage in their yards. One member of the trade said he would not be surprised to see a price peak Nov. 1 of $25-$28 for No. 1 heavy melting steel and $30 for low phos.

Foundries' need for scrap has brought them into the market and as a result prices on cast grades are strengthening.

Cincinnati—Iron and steel scrap prices remain unchanged on lack of buying for mill accounts. The undertone is strong in reaction to recent increases in other districts.

Chicago—Movement of steelmaking scrap improved last week. Several mills bought limited quantities and the market as a whole continued its upward trend. One major mill limited its purchases to industrial scrap, paying $4 more than it previously had for No. 1 and No. 2 steel. Dealer material is in good demand in several major grades, although the call for bundles continues depressed. No. 1 heavy melting steel is $24-$25; No. 2 steel, $22-$23; No. 1 bundles, $24-$25; No. 2 bundles, $22-$23.

On the basis of the lowest bid received for low phos, by one generator, bar crops and plate scrap and punchings are quoted $29-$31. Cupola and auto cast are in good demand, particularly from captive foundries, which are paying $40-$41 for these grades. No. 1 wheels are going at $33-$34. Stove plate is quoted $29-$30.

Railroad material is also involved in the latest price upsurge, No. 1 heavy melting bringing $25.50-$27; rerolling rails, $37-$38; random length, $34-$35; 2-feet and under rails, $38-$39; 18 in. rails, $39-$40. Angles and splice bars are up $1 to $33-$34.

Pittsburgh—Sale of No. 1 industrial heavy melting scrap at $25 and No. 2 grade at $22.50 helps to clarify consumer delivered quotations on open-hearth scrap at the mill level. Tonnage involved generally would be considered too small to establish a consumer market price, but in absence of other mill purchases, these were interpreted as the current market level. The previous purchase by a mill was at $21 for No. 1 and compares with an intervening range of $23-$24 among brokers and dealers. Other open-hearth prices on other open-hearth grades are correspondingly higher. The turnings market is stronger with a mill purchase of short turnings at $20.

Activity in cast grades has subsided considerably, although a sale of No. 1 cupola is noted at $34, up $1, and heavy breakable at $27.50, up 50 cents.

Leading mills are not expected to enter the dealer scrap market until after clarification of the labor issue. Considerable tonnage of No. 1 industrial scrap is moving at $23.50. Considerable tonnage of scrap has been shipped out of Pittsburgh to Youngstown-Sharon area to fill $25 mill commitments.

San Francisco—Movement of scrap continues sluggish. Prices have shown no tendency to firm in line

with the eastern trend. Mills generally are well supplied and are buying only sufficient tonnages to keep stockpiles at even levels. The leading ingot producer in this area recently raised production to 80 per cent of capacity from around 60 per cent, indicating it may be in the market soon for increased quantities, but the second largest producing interest maintains an ingot rate of slightly under 50 per cent.

St. Louis—Scrap prices here the last two weeks have remained generally unchanged, largely waiting on the bellwether Granite City and Laclede steel companies to place their September orders.

Los Angeles—For the first time in many months, demand for scrap is showing some spark. Mills are inquiring for increased tonnages, although for the time being it may not be easy for dealers to meet stepped-up needs because collections are slow and some yards have little inventory. Current pace of residential construction is aiding some foundries, who have booked considerable orders for soil pipe and fittings. As a consequence, demand for No. 1 cupola cast is reviving, and the price has edged up $1 per gross ton to $28.50.

Seattle—Steel scrap is steady at $16 for No. 1 and No. 2 heavy melting, mills buying sufficient tonnnages to cover current consumption. Inventories are static. Some buying interests have been out of the market temporarily. Foundries are purchasing cast iron sparingly, paying a maximum of $22 for No. 1 cupola. Demand for foundry items is slightly improved but operations are down to about 50 per cent of capacity in this area.

Canada . . .

Toronto, Ont. — While Canadian pig iron production increased to a new all-time record in May, output of steel ingots and castings was below the record made in March, but exceeded output for April.

With 12 of the 14 blast furnaces blowing, pig iron production in May totaled 202,148 net tons, or 86.7 per cent of rated capacity, compared with 80.1 per cent for April and 82.9 per cent for May, 1948.

Output of ferroalloys in May amounted to 20,652 net tons and included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chromx and ferrophosphorous.

Production of steel ingots and castings in May totaled 293,179 net tons of which 273,359 tons were steel ingots and 10,449 tons castings. Production of steel maintained a rate of 91 per cent of rated capacity compared with 86.6 per cent in April and 89.9 per cent in May, 1948.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2700 tons, Mt. Sinai hospital addition, New York, to the Ingalls Iron Works, Birmingham, Ala., with fabricating plants in that city and Verona.

1500 tons, telephone building, Portland, Oreg., to American Bridge Co., Pittsburgh.

1200 tons, Sun river bridge, Great Falls, Mont., to Allied Structural Steel Cos., Chicago.

1080 tons, apartment house, 36th street and Park avenue, Pierpont Estates, New York, through Henry Roth & Son, to Harris Structural Steel Co., that city.

1000 tons, sluice gates, frames, etc., Pine Flats U. S. Engineer project, California, to Washington Iron Works, Seattle.

900 tons, steel grid flooring, Massachusetts avenue bridge repairs, Boston-Cambridge, Mass., to Reliance Steel Products Co., Pittsburgh.

870 tons, building, Chicago *Herald-American*, to Hansell Elcock Co., Chicago.

700 tons, warehouse, Goodrich Rubber Co., Miami, Okla., to Capitol Iron & Steel Co., Oklahoma City, Okla.; Jones Bros. Construction Co., Joplin, Mo., general contractor.

630 tons, parts depot, Memphis, Tenn., International Harvester Co., to Allied Structural Steel Cos., Chicago.

600 tons, plates and shapes, elevated water tank, Niagara Falls, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

540 tons, Hines veterans hospital, Chicago, to Hansell Elcock Co., Chicago; Ashland Construction Co., Chicago, general contractor.

500 tons, Public School No. 171, Queens, New York, to Schacht Steel Construction Inc., New York.

455 tons, state bridge Sec. 42F, Carmi, White county, Illinois, to Allied Structural Steel Cos., Chicago.

400 tons, boiler house building 99, Canton, Ill., International Harvester Co., to Allied Structural Steel Cos., Chicago.

400 tons, REA power plant, Creston, Iowa, through Des Moines Steel Co., Des Moines, Iowa, to Carnegie-Illinois Steel Corp.

400 tons, extension, Electro-Motive Division Bldg., La Grange, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

365 tons, Ferry Hill bridge, Stillwater river,

Orono, Me., to Bancroft & Martin Co., Portland, Me.; Ellis C. Snodgrass Inc., Portland, general contractor, $386,806.90.

300 tons, addition, Lighthouse for the Blind, East 60th street, New York, through George A. Fuller & Co., to Schacht Steel Construction Inc., that city.

300 tons, bridge, Mitchell, S. D., to Iowa Steel & Iron Works, Cedar Rapids, Iowa.

290 tons, viaduct, Municipal Board of Transportation, Bronx, New York, through John Roman, contractor, to Jones & Laughlin Steel Corp., Pittsburgh.

260 tons, Veterans Administration Hospital, Madison, Wis., to American Bridge Co., Pittsburgh.

232 tons, bridge Sec. 0203.1HF, Cook county, Illinois, to Allied Structural Steel Cos., Chicago.

225 tons, warehouse, Milwaukee, International Harvester Co., to Allied Structural Steel Cos., Chicago.

225 tons, public school, Rome, N. Y., to Rome Iron Works, that city.

210 tons, west side elementary school, Joliet, Ill., to Allied Structural Steel Cos., Chicago; steel to be provided by Carnegie-Illinois Steel Corp.

210 tons, Lake street bridge repairs, Chicago, to American Bridge Co., Pittsburgh.

210 tons, public school, Elmira, N. Y., to the Ernst Iron Works, Buffalo.

207 tons, Cook County Hospital dormitory, to Johnson Iron Works, Chicago; Warner Construction Co., general contractor.

200 tons, schools, miscellaneous construction, to Isaacson Iron Works, Seattle.

197 tons, bridge Sec. 0303.1HF, Cook county, Illinois, to Allied Structural Steel Cos., Chicago.

191 tons, bridge Sec. 066-0303.4MFT, Cook county, Illinois, through Arcole Midwest Corp., Chicago, to American Bridge Co.

170 tons, power station, Rockland Power & Light Co., Middletown, N. Y., to the Elizabeth Iron Works, Elizabeth, N. J.

170 tons, building, Colton, N. Y., to Smith & Caffrey, Syracuse, N. Y.

155 tons, bridge Proj. F1002-15, Larimer county, Colorado, to Burkhardt Steel Co., Denver.

150 tons, stop logs and derricks, McNary dam, Oregon, to Washington Iron Works, Seattle.

146 tons, bridge, Newport, Vermilion county, Ind., to Vincennes Steel Corp., Vincennes, Ind.

140 tons, expansion to temporary terminal, New York City International Airport, to Oltmer Iron Works, Jersey City, N. J.

137 tons, bridge Proj. SO814(1), Ozaukee county, Wisconsin, to Milwaukee Bridge Co., Milwaukee.

130 tons, Italian Old People's Home, Melrose Park, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

125 tons, Coca Cola bottling plant, Waukegan, Ill., to Hansell Elcock Co., Chicago.

100 tons, Bureau of Roads bridge, Montana, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, Village bridge, Sebasticook river, Burnham, Me., to Bancroft & Martin Co., Portland, Me.; P. E. Susi & Co., Pittsfield, Me., general contractor.

Unstated tonnage, bus terminal, Dixie Greyhound Bus Lines, Hernando, Tenn., to Fischer Steel Corp., Memphis, Tenn.

STRUCTURAL STEEL PENDING

1500 tons, machinery, stop logs, etc., navigation Lock, McNary dam; Consolidated Western Steel Corp., Los Angeles, apparently low $641,280, to U. S. Engineer.

1275 tons, Blue Creek Bay bridge, Coeur d'Alene, Idaho; bids to Bureau Public Roads, Portland, Oreg., Sept. 14.

1120 tons, Chelsea Biltmore apartments, Atlantic City, N. J.; bids closed.

900 tons, library and classroom, Cornell University, Ithaca, N. Y.; bids Sept. 7.

700 tons, Public School No. 178, Queens, New York; bids Sept. 6.

700 tons, Public School No. 165, Queens, New York; bids Sept. 14.

610 tons, Public School No. 18, Bronx, New York; Psaty & Fuhrman Inc., low on the general contract.

610 tons, McNary dam and power house construction; general contract to McNary Dam Contractors.

400 tons, hospital, Batavia, N. Y.; bids Sept. 11.

400 tons, alterations, Columbus Hospital, Mission Sisters of Sacred Heart, New York; inquiry revised.

340 tons, Beth-El Hospital, Brooklyn, N. Y.; bids closed.

220 tons, synagogue, Young Israel of the Bronx, New York; bids Sept. 7.

200 tons, Allenton bridge, King county, Washington; general contract to T. N. Buchanan Co., Seattle, low $160,351.

200 tons, intake and outlet structures, McNary dam; bids to U. S. Engineer, Oct. 5.

200 tons, Radio Corp. of America building, Princeton, N. J.; bids asked.

200 tons, public school alteration, Addison, N. Y.; bids close Aug. 31.

100 tons, hospital addition, Meadowbrook, L. I.; bids asked.

Unstated tonnage, school, Our Lady of the Cenacle Roman Catholic Church, Jamaica, Long Island; general contract to Tweedy Engineering Co., New York.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, miscellaneous construction projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, steam power plant, Creston, Iowa, to Laclede Steel Co., St. Louis.

REINFORCING BARS PENDING

7500 tons, McNary dam project, Columbia river; general contract to McNary Dam Contractors.

465 tons, relocation housing site No. 3, Chicago; bids asked.

450 tons, Fairbanks, Alaska, civic center and school; Peter Kiewit & Sons and J. C. Boespflug, Seattle, joint low $2,141,999.

273 tons, generating plant, Elk River, Minn.; bids asked.

130 tons, Standard Oil terminals, Seattle; bids out.

125 tons, women's dormitory, Kalamazoo, Mich.; bids asked.

120 tons, Wonder bakery plant, Seattle; bids out.

115 tons, parish hospital, Pasco, Wash.; S. S. Mullen, Seattle, general contractor.

100 tons, outfall and intake McNary dam; bids to U. S. Engineer, Oct. 5.

100 tons, Public Roads bridge, Coeur d'Alene, Idaho; bids to Portland, Oreg., Sept. 14.

Unstated, $900,000, unit addition to Vancouver, B. C., general hospital; Maxwell Construction Co. Ltd., Vancouver, Wash., general contractor.

PLATES . . .

PLATES PLACED

Unstated tonnage, steel tanks, Chicago procurement office, Corps of Engineers, to Parkersburg Rig & Reel Co., Parkersburg, W. Va., $197,100.

PLATES PENDING

14,900 tons, caisson and other facilities McNary dam; general contract to McNary Dam Contractors.

900 tons, tunnel lining, etc., McNary dam; bids to U. S. Engineer, Walla Walla, Wash., Oct. 5.

Unstated, 22 oil storage tanks and other items, Seattle marine terminals Standard Oil Co.; awards pending.

RAILS, CARS . . .

RAILROAD CARS PLACED

Louisville & Nashville, 100 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co.; delivered scheduled for late this year from Bessemer, Ala., plant.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

Los ANGELES—Twentieth Century-Fox Film Corp., 2019 S. Vermont Ave., has awarded a $220,000 contract to Weymouth Crowell, 2906 Marsh Ave., for construction of a film exchange building; Albert C. Martin & Associates, 333 S. Beaudry St., architect.

NORTH SACRAMENTO, CALIF.—Pacific Gas & Electric Co., 243 Market St., San Francisco, may construct a six million cu ft underground gas storage holder, $1,297,000.

COLORADO

RIFLE AND NEWCASTLE, COLO.—Columbine Development Co., Preston Walker, general manager, Grand Junction, Colo., has plans for a $15 million paper mill.

CONNECTICUT

BRIDGEPORT, CONN.—Jenkins Bros., Main street, has plans prepared by Fletcher Thompson Inc., 211 State St., for a $125,000 warehouse, railroad tracks on State street extension.

DELAWARE

WILMINGTON, DEL.—Hercules Powder Co., Ninth & Market Sts., has asked bids for a $400,000 research laboratory; R. N. Wheelock, c/o owner, chief engineer.

GEORGIA

CHAMBLEE, GA. — Massey-Harris Co., c/o Hanker & Heyer, architect, Commerce Title Bldg., Memphis, Tenn., will soon let contract for a warehouse and office, $225,000.

ILLINOIS

CHICAGO—Filice & Caporale Dairy Products Inc., 9600 S. Torrence St., has awarded a $135,000 contract to Olivieri Bros. for construction of a milk processing plant; Philip A. Faro, 3029 E. 92nd St., architect.

CHICAGO—Hansell-Elcock Co., 3153 S. California St., has awarded a $300,000 contract for an assembly foundry to Carroll Construction Co., 333 N. Michigan Ave.; Alfred Benesch, 30 E. Adams St., architect.

CHICAGO—Richheimer Coffee Co., Robert C. Richheimer, president, 1127 N. Halsted St., has plans prepared by Friedman, Alshuler & Sincere, 223 W. Jackson Ave., for a $300,000 coffee roasting and packing plant.

MELROSE PARK, ILL.—Benjamin Moore & Co., 415 Green St., Chicago, has awarded separate contracts for $650,000 for a factory, office, warehouse and boiler house, Melrose Park, 25th street & North avenue.

KANSAS

WICHITA, KANS.—D. R. Lauck Oil Co., 4 National Bank Bldg., has awarded a $225,000 contract to Hahner & Foreman, 121 N. Waco St., for construction of a commercial garage; Overend & Boucher, architect.

WICHITA FALLS, KANS.—Wichita Meat & Provision Co. has awarded a $165,000 contract for a meat plant unit, own forces.

KENTUCKY

ST. MATTHEWS, KY.—Koster-Swope Buick Inc., Lexington Rd., has awarded a $175,000 contract to Whittenberg Construction Co., 2214 S. Floyd St., Louisville, for a sales and service building; Joseph H. Kolbrook, Starks Bldg., Louisville, architect.

MISSOURI

ST. LOUIS—Mandel Investment Co., M. H. Mandel, president, 2120 Locust St., may spend $300,000 for a parking garage, remodeling Taylor Bldg., St. Charles street, in block from Ninth to 10th streets.

NEBRASKA

LINCOLN, NEBR.—Equity Union Grain Co., Board of Trade Bldg., Kansas City, Mo., may construct a $2 million grain elevator.

NEW JERSEY

TOMS RIVER, N. J.—Cuba Pharmaceutical Products Inc., 555 Morris Ave., Summit, N. J., is considering building a $1 million drug manufacturing plant.

NEW MEXICO

ALBUQUERQUE, N. Mex.—U. S. Engineer, Box 1538, has awarded a $1,209,000 contract to R. J. Daum Construction Co. for construction of a machine shop and industrial type building.

OHIO

CLEVELAND—Lake Erie Co-operative Grocers, 5515 Hough Ave., has awarded a $225,000 contract to Sam W. Emerson Co., 1836 Euclid Ave., for a warehouse and office building at railroad siding at W. 150th St., New York Central Railroad.

GEORGETOWN, O.—Hanna Coal Co., c/o James Hyslop, St. Clairsville, O., may build a $3.5 million coal treatment plant; Allen & Garcia, 332 S. Michigan Ave., Chicago, engineer.

MANSFIELD, O. — Martin Steel Products Corp., 111 W. Longview Ave., will share in the job of producing aluminum steel storage bins for the United States government by building 120 aluminum bins; the government recently announced plans for a huge bin-building program to store an expected 500 million bushels of surplus corn.

YELLOW SPRINGS, O.—Morris Bean & Co. has awarded a contract for the engineering and construction of an aluminum precision molding foundry to H. K. Ferguson Co., Cleveland.

OKLAHOMA

BLACKWELL, OKLA.—Bartlesville Zone Co. is considering building a $500,000 zinc smelter.

OREGON

SALEM, OREG.—State Board of Control has approved a $1,243,000 improvement project at the state penitentiary, including a $625,000 cell block and $400,000 control room.

SALEM, OREG.—State Highway Board, H. B. Glaisyer, secretary, has called bids Sept. 20 for construction of a $1.8 million reinforced office structure; plans by Whitehouse, Church, Newberry & Roehr, Portland, Oreg.

PENNSYLVANIA

ERIE, PA.—Erie Brewing Co., 2131 State St., has awarded a $172,650 contract to E. E. Auston & Son, 20th & Reed Sts., for a warehouse.

MCKEESPORT, PA.—National Tube Co., Frick Bldg., Pittsburgh, has awarded separate contracts, $500,000, for construction of a sintering plant, National Works; Thomas Russell, c/o owner, engineer.

NEW CASTLE, PA.—New Castle Packing Co., County Line road, has plans prepared by Henschein, Everds & Crombie, 59 E. Van Buren St., Chicago, for a $250,000 packing plant, Mahoning avenue.

TENNESSEE

CHATTANOOGA, TENN.—Tennessee Products & Chemical Corp., Alton Park, may spend $300,000 rebuilding a chemical building.

MEMPHIS, TENN.—Plough Inc. has authorized Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., to proceed with plans and specifications for construction of an addition to and remodeling of existing structure recently acquired; H. B. Solmson, vice president, drug concern.

TEXAS

BEAUMONT, TEX.—Gulf States Utilities Co., 362 Liberty St., has awarded a $550,000 contract to Stone & Webster Engineering Corp., M. Esperson Bldg., Houston, for construction of a power station.

COLORADO, TEX.—Texas Pipe Line Co. & Associates, Texas Bldg., Houston, may soon

let a contract for a $475,000 receiving station.

HOUSTON—Southwestern Sugar & Molasses Co., Manchester street, has awarded a $120,000 contract for a molasses plant unit, own forces.

HOUSTON — Standard Rendering Co., 3701 Schalker St., has awarded a $145,000 contract for a rendering plant expansion, own forces.

VICTORIA, TEX.—E. I. du Pont de Nemours & Co., Du Pont Bldg., Wilmington, Del., may soon let a $246,000 contract for nine manufacturing buildings and four service buildings, own forces.

WASHINGTON

SEATTLE—Directors of Standard Oil Co. of California announce a $1 million improvement at local marine terminals; plans include 22 new storage tanks, warehouse, pier pump house and loading facilities.

SEATTLE—Plant of Sunset Foundry & Mfg. Co., near suburban Renton, sustained a $10,000 loss in blast fire.

CANADA

VANCOUVER, B. C.—Austin Co., Seattle, has the contract to design and construct a $200,000 reinforced concrete office structure for Aluminum Co. of America.

COBOURG, ONT.—Bradford Dyeing Association (Canada) Ltd., 54 Front St. W., Toronto, Ont., is considering a $1 million plant facilities extension.

LONDON, ONT.—General Motors Corp., C. E. Wilson, president, may spend $5 million on Crumlin plant which manufactures diesel locomotives; F. J. Lyle, c/o owner, engineer.

SCARBOROUGH, ONT.—S.K.F. Co. Ltd., 1057 Bay St., Toronto, Ont., is considering spending $3 million on a plant.

TORONTO, ONT.—Bauer & Black, Kendal Mills Division, 419 Coxwell Ave., has awarded a $400,000 contract to Milne & Nicholls Ltd., 57 Bloor St. W., for a plant.

WELLAND, ONT.—Brewers Warehouse Co. Ltd., 19 Richmond St. W., Toronto, Ont., has awarded a $225,000 contract to Garner Construction Co. Ltd., 7 Riverbank St., for a warehouse.

THREE RIVERS, QUE. — Eastern Agencies Ltd., 108 Gallery Square, Montreal, Que., is considering building a $1 million brewery.

QUEBEC, QUE.—David Pike & Co., Bingley near Bradford, England, has awarded a $200,000 contract to Francois Jobin Inc., 88 St. Louis Rd., for a textile plant, St. Sacrement avenue; L. Mainguy, 1045 Shaumont Ave., architect.

FERROALLOY PRODUCT PRICES

(Continued from Page 143)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C. 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot. add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79. 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

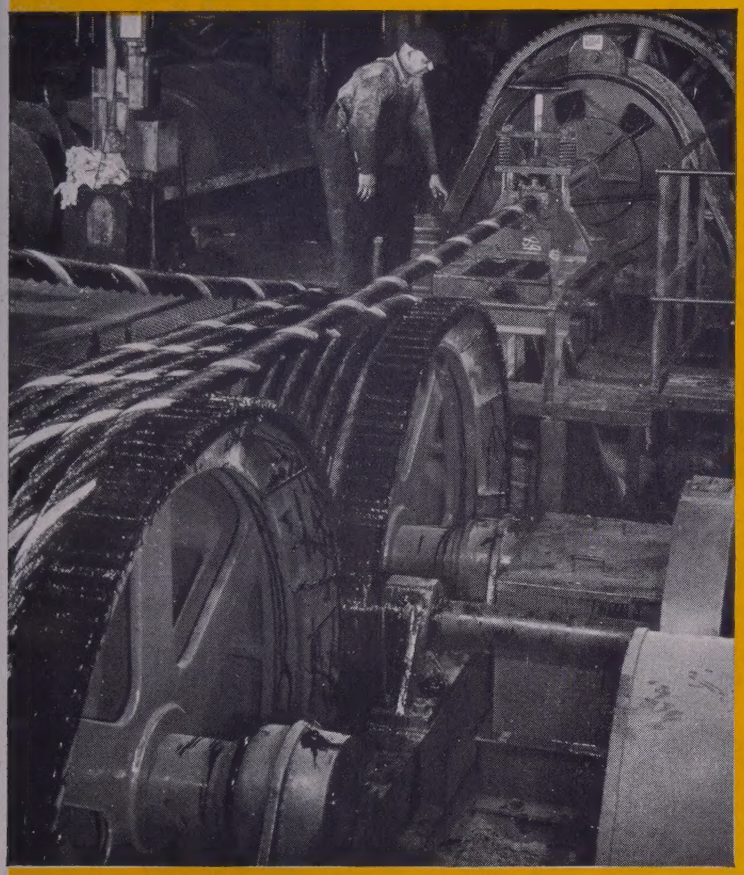
Simanal (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.55c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

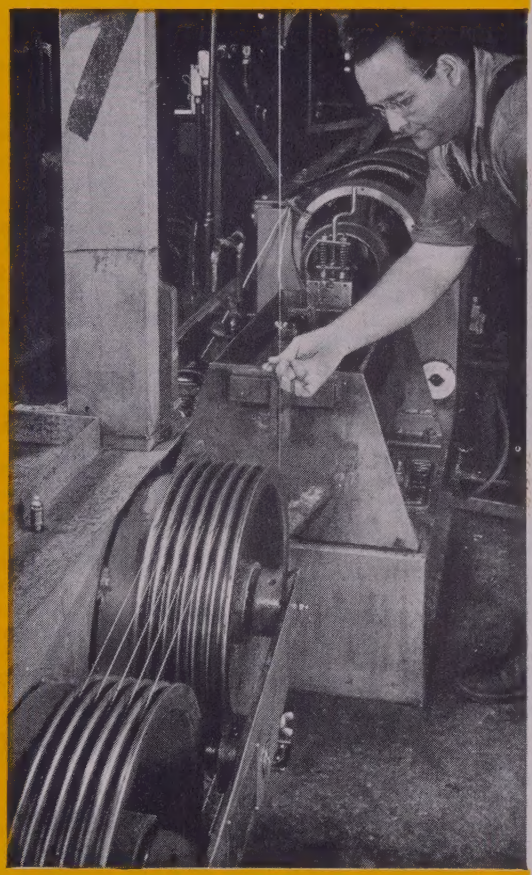
Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

This photograph shows a 3⅛" diameter Monarch Whyte Strand Wire Rope coming off a Macwhyte closing machine. Weight of this rope is approximately 16.65 pounds per foot. It has a strength of approximately 392 tons and is used for the digging line on large dragline excavator with 35 cu. yd. bucket.



In this photograph is a 3/64" diameter Stainless Steel Cord coming off a Macwhyte closing machine. It weighs approximately 0.35 lbs. per 100 feet; has a strength of approximately 270 pounds, and is used for many small cord needs.



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Behind the Scenes . . .

Watch Those Numbers

For some time now the editors have been overheard talking numbers instead of words, throwing out phrases of statistical gibberish, making with the slide rules and calculators. We asked several people what was cooking but couldn't get any very satisfactory answer. They were always of the "wait and see" variety. Things kept getting worse, until the other day Editor Irwin H. Such, the usual cool, calm and unruffable boss of the staff slithered into the office here under the steam pipes. With a strange gleam in both of his eyes, he announced, "I know what the price of bars is in Pittsburgh!" With that we quickly ran to his aid, but he recovered himself well, and went on to say that within the next couple of weeks we'll know all. He broke down far enough to admit that all the work (and it has been a tremendous effort, judging by the gross weight of paper involved) was aimed at our market section. So keep your eyes on the back of the book, where big new features will be breaking ere long. Already the finest, most complete job in the industry on prices and market reports, STEEL's weekly roundup will soon be farther ahead of the parade than ever. So, if you buy ferrous or nonferrous metals of any description, you'll soon have a new and indispensable tool at your fingertips every Monday morning.

Half a Century Ago

Changes in methods of industrial financing are evident from the following letter, published in STEEL fifty years ago this week: "Steel and iron stocks are now very popular in Wall Street. The Public is clamoring for the issues of the large companies, and the common and preferred combined are all selling above par, with indications of higher prices. We believe candidly the Union Steel and Chain Co.'s stock will pass 150 within the next six months, for the reason that the accepted plants are diversified, which will more fully guarantee dividends than one single line that may have months of very dull business." Sounds good, doesn't it? The catch is, or was, that the company mentioned hadn't even been formed, nor had the owners of the plants which were to be combined even been asked whether they were willing to sell their properties! However, the directors of the to-be-formed concern included men by the names of Belmont, Rockefeller, Poor and Holmes—of whom much more was to be heard later. That week, E. H. Gary of the Federal Steel Co. returned from Europe. "General" J. S. Coxey, of the army by the same name, was busily letting contracts for his new steel foundry in Massillon, Ohio, and at Shelby, Ohio, the Shelby Tube Co.'s plant burned down with a loss of $40,000.

Confusing, Isn't It?

William Feather, who has compiled many a neat phrase and quotable clause, says, "To make what you make you have to spend what you make to make what you make; and consequently whatever you make you are making no more than you used to make when you were not making as much as you now make." After accompanying our kids on a preschool clothing expedition, we are inclined to agree.

Census Dope Available

Nearly every day's mail brings us copies of data from the 1947 Census of Manufactures. Now being issued piecemeal by the Bureau, the information replaces basic 1939 data which has served as the basis for industrial statistics for the past ten years. Many sections of the metalworking industry have now been completed and are available through the Superintendent of Documents, Washington. Some of the sections now available are those on nonferrous metals, instruments, metal furniture, screw machine products, stampings, bolts & nuts, pumps, household appliances. There are many others — probably including your own products or products representing your customers. Better make a note to check through your local field office of the Department of Commerce, your Washington representative (or 5 percenter), or write direct to the Supt. of Doc. for a list of the material already available and coming up later.

Shrdlu

(Editorial Index—page 69)

STEEL

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